

**NAVAL
RADIO COMMUNICATIONS
in the
ELEVENTH NAVAL DISTRICT
San Diego, California**

way to the Philippines and probably a little shore leave.

The "Great White Fleet" stopped in San Diego on the way around the world. In 1912 the Navy established a Fuel Annex on Point Loma but it was a coaling station only. Utilization of San Diego as a center for fleet activities did not commence until a much later date.

Point Loma.

During World War I, the area now comprising the Eleventh Naval District, a part of the neighboring district to the north, was officially designated as the Twelfth Naval District, South. Since the major part of the activity of that war was centered in the European theater, there was little need for the development of facilities in the west, except for training purposes.

Construction of a Naval Hospital as a permanent facility was planned and undertaken. A Public Works Office was organized and established in 1917; the Naval Air Station on North Island and the Marine Corps Base on Point Loma were established at approximately the same time. During the war both Army and Navy utilized the Naval Air Station for flight training but by mutual agreement the Army abandoned its interests soon after cessation of hostilities. Radio stations which had been established at Point Loma and Chollas Heights in 1906 and 1917, respectively, were a part of the shore establishment.

In 1919 the Pacific Fleet was established, with headquarters in San Diego.

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In January 1920, when the Naval Base, San Diego was established under the command of Rear Admiral Roger Welles, all activities in the San Diego area were made a part of that command. These consisted of the Naval Air Station, the small and temporary housed Naval Hospital, the Public Works Office, the Naval Fuel Depot a Marine Corps Advanced Base used principally for training and the radio stations at Point Loma and Chollas Heights.

By the end of the year, when it became apparent that a Naval District, separate from the Twelfth was to be established, the Navy investment in the shore establishment within the confines of the new district, was under six million dollars, with the Air Station having been the recipient of over half of the total expenditures and the Marine Corps Base responsible for most of the balance.

early 1963

The new Naval District was established on January 28, 1921, exactly one year after the establishment of the Naval Base. Rear Admiral Welles was the first Commandant. With a staff of seven officers, including the Commandant, the officer personnel of the district numbered about 100, most of whom were connected with the Air Station. The Commandant had his office in the Administration Building of the Air Station.

The Emergency Shipbuilding Corporation, a government agency engaged in building concrete ships, had been in operation in the lower San Diego bay area during the latter part of the war, but when the war ended there was no further use for its activities so the Navy decided to take over the shop facilities there for the upkeep of destroyers no longer part of the fleet.

It was in February 1921 work on the Destroyer Base began. On February 23, 1922, was commissioned as an activity of the Eleventh Naval District and as part of the Naval Base, San Diego. The Air Station and the Marine Corps Base were expanded. Total expenditures for the year were about six million dollars.

In May 1922 the Naval Supply Depot building at the foot of Broadway was completed. District Headquarters moved from North Island to its present site.

The District began a slow expansion. By 1925 total expenditures by the Public Works Office had grown to about sixteen million dollars; in 1928 to 20 million. During the next ten years growth accelerated. The Air Station, taking full advantage of aircraft as an implement of war, made a fourfold expansion and had by that time accounted for fully a third of the fortythree million dollars which had been expended in Public Works in the District.

As of the close of World War II, the total expenditures for facilities within the district were between six and seven hundred million dollars or approximately fifteen times that which had been expended previously.

In 1945, the District included the counties of Santa Barbara, Kern, San Bernardino and six other counties in the southern part of California, the county of Clark in Nevada and the states of New Mexico and Arizona. With Naval Operating bases at both San Diego and San Pedro, a Naval Base at Port Hueneme, and a multitude of other large activities in the District, the Eleventh Naval District had become gargantuan both physically and administratively. The NOB, San Diego included the Naval Repair Base with its four commands; the Naval Training Center with its three major commands; a great Naval Supply Depot; a sprawling Naval Hospital with corps school and annex; the Marine Corps Base, and a multitude of lesser but nonetheless very important activities.

Naval Air Bases, with headquarters in San Diego, included not only the original Naval Air Station situated on North Island, but also over twenty other Naval Air Stations, Naval Air Facilities, Naval Air Auxiliary Stations and Marine Corps Air Stations.

Naval Operating Base, San Pedro, was composed of 20 or more activities and facilities, of which the mammoth Naval Drydocks, established in 1943, was the greatest. In addition there were Roosevelt Base, which at the time of its establishment in 1941 included all the various activities located on Terminal Island; a Naval Hospital and dispensaries; a Naval Supply Depot and its two Fuel Annexes; a Receiving Station and Disciplinary Barracks.

The Naval Base, Port Hueneme, was established in January 1944, consisting of an Advanced Base Depot, Receiving Barracks, AA Training Center, ACORN Assembly Training Detachment and other smaller activities.

The Eleventh Naval District, at the end of the war, had approximately four hundred commands, activities and facilities, and was exceeded only by the Third and Twelfth Districts in size and importance of activities.

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Prior to the invention of wireless telegraphy and its adoption by the U.S. Navy for communication with Navy ships, commanding officers received their orders by cable or telegraphic messages addressed to them at their ports of call.

In 1890, telegraph or cable facilities were available in almost every port frequented by Navy ships.

During the Spanish-American war in 1898, the Navy Department's cable connections with Commodore Dewey, in command of the Asiatic Squadron in Hongkong, were via the Atlantic, down through the Mediterranean, the Red Sea, the Indian Ocean and on to Hongkong. The acute need for some means of rapid communications between the various squadrons and the Navy Department was positively indicated, since there was a growing tendency to make strategic naval decisions at Washington rather than in the theater of operations. In view of the developing needs, the advent of radio was most timely and the Navy Department became interested in its possibilities immediately upon conclusion of the conflict.

At the turn of the century wireless telegraphy hit the world with a dramatic impact. Immediately the Navy invited Guglielmo Marconi, often called the father of wireless communication, to conduct experiments in America to see if this new system could be applied to ship-shore communications.

In 1899, the first official Navy wireless message was sent from the Steamship CONCE to the Highland Station on the New Jersey coast, with Marconi as the operator. The transmission was accomplished during a Naval parade in honor of Admiral George Dewey, returning victoriously from Manila.

The Navy established its first wireless test stations at the Naval Academy, Annapolis, and at Washington, D.C. Wireless devices were installed in three U.S. Navy ships, the USS NEW YORK, USS MASSACHUSETTS and USS PORTER. As additional ships were equipped with wireless apparatus, some resistance surfaced among commanding officers who were not desirous of too close contact with Washington. The traditional power of a commanding officer to do as he felt best with his ship or command as soon as he got out of sight of land would have been completely wiped out if someone in the Bureau of Navigation or elsewhere could give him orders. So, often the instructions to the wireless room were to shut down the wireless and not to acknowledge calls from shore at all.

The Navy Department immediately began to implement its plans to establish a chain of shore wireless stations on each coast and another, higher power, chain across the Caribbean to the Canal Zone.

The original equipments were very crude with little provision for changing the transmitting frequency. In most cases the emitted frequency was governed by the natural period of the antenna. Navy installations operated in a band close to 750 Kc. Effective communication distances were short. Static and interference tended to further limit effective communication distances.

The shore stations were spaced along the coasts to provide communication with ships in close proximity to each station. Messages from Washington were either delivered to the closest station by landline telegraph for further relay to the ship or by wireless relay from station to station.

At the end of 1904, there were about 25 shore stations manned and ready to transmit and receive messages. Most of those stations were on the East Coast.

There was much unintentional interference between naval, commercial and amateur stations. No attempt was made to use several different frequencies. The wide-band transmissions of the old spark apparatus emitted at least one additional frequency almost equal in intensity to the primary and their combined emissions covered most of the spectrum in use. Control of the air was usually pre-empted by stations with high power and large antenna systems. Their transmissions carried through to their limited range by drowning out all others in the vicinity. No efforts were made to limit the power used to that required for the distance involved.

The Navy tried to exercise discipline in wireless communications by issue of a special Notice to Mariners No. 472 dated 22 December 1904. Here is a quote from a part of that notice: "A vessel wishing to communicate with a station and having ascertained by "listening in" that she is not interfering with messages being exchanged within her range should make the call letters of the station at a distance not greater than 75 miles from it. The call should not be continuous, but should be at intervals of three minutes in order to give the station a chance to answer.....then the vessel begins to send messages, stopping at the end of each 50 words and waiting until the station signals O. K. and go ahead....."

In 1904 President Theodore Roosevelt designated the Navy to provide efficient coastwise communications for the U. S. Government and, when not in competition with commercial stations, to receive and transmit all radio messages to and from ships at sea. "Instructions for the Transmission of Messages by Wireless Telegraphy, U. S. Navy 1904" were promulgated on the same day that President Roosevelt approved the designation of the Navy to have sole control over ship-shore communications.

In 1905 the Navy's Bureau of Equipment issued the first international call book of wireless stations.

The year 1906 witnessed the completion of the West Coast chain of Navy wireless stations. Most of them were built in the vicinity of lighthouses so that their transmissions would be primarily over water. This system constituted a highly successful relay network from Canada to the Mexican Border, day and night. LCDR George C. Sweet and R. B. Stuart opened the Mare Island station on March 30, 1904. Then came a station on Yerba Buena Island (Goat Island) in San Francisco Bay on May 5, 1904. Next came the Farallon Island station, installed by George Hanscom, which began operations on December 8, 1904. Point Arguello followed on February 6, 1906. Then Point Loma at San Diego on May 12, 1906. Table Bluffs opened on October 23, 1906, followed in quick succession by Cape Blanco, North Bend and Tatoosh Island off Cape Flattery. Next came the Alaska system, built by George Hanscom, after it had been planned by LT E. H. Dodd. A station in Sitka was opened in 1907, and one in Cordova in 1908. Kodiak, Dutch Harbor, St. Paul, Unalga and St. George followed in 1912.

The Point Loma site was selected in 1905 by CQMDR R. C. Gearing and George E. Hanscom of the Mare Island Navy Yard. The birth of "Navy Radio San Diego" occurred on the 12th of May 1906. The occasion was the commissioning of a "Massie" type spark transmitter in a neat little yellow cottage atop Point Loma, by Robert B. Stuart, then a Chief Petty Officer in the U. S. Navy and a specialist in wireless installations. The equipment was received and loaded into a horse-drawn wagon at the Santa Fe wharf in San Diego. Nine hours later it reached the Point Loma site. In those early days, Point Loma was often isolated from San Diego when rain made the roads impassable.

The installation of the transmitter was completed not long afterwards at nine o'clock in the evening and a naval precedent established when enlisted men commissioned the station.

It was planned that the Point Loma station would serve as a relay link in the Mare Island - Farallon Islands - Point Arguello - San Diego circuit. However, on the evening that the installation was completed, Chief Stuart gave Mare Island, about 500 air miles distant, a hesitant call and was astounded by an immediate answer. This contact set a new record for Navy wireless communication over land. The previous record had been 110 miles.

The first petty officer in charge was R. W. Moore, Electrician 2nd Class. Of course at that time there were no radiomen. It was customary to take telegraph operators and instruct them in electrical fundamentals or to take Navy electricians and train them as operators. The early operator was necessarily self sufficient. He had no technicians to fall back on and had to know his installation from A to Z. No excuses were accepted for not keeping his station on the air. This doctrine developed a group of sailor communication experts whose pride in service was the highest.

Navy ship-shore communications in 1906 were limited to short ranges because of the crude equipment used and inadequate information regarding the theory of radio wave propagation. Despite this limitation the radio station at Point Loma handled 3,000 messages during its first year of operation. This may seem like an insignificant amount of traffic, however when you realize that there were only 12 Navy vessels in the Pacific at that time equipped with wireless, that number becomes more meaningful.

The initial tasks assigned to the station at Point Loma were the transmission and reception of messages between Naval ships and shore, handling of commercial messages with merchant ships and relaying messages between Naval shore stations along the coast.

Point Loma served as a means of communication with U. S. nationals in Central America during the era of dollar diplomacy, utilizing the USS CALIFORNIA, an armored cruiser stationed at Guaymas, in the Gulf of California (and other Naval vessels) as wireless links. Point Loma communicated with radiomen employed by United States interests at mines and sugar companies throughout Central America.

By the end of 1906, the Navy had purchased and installed equipments from many companies. About half were of German manufacture. The original transmitters had been modified to give a 500 cycle note instead of the original 50 cycle note, by increasing the number of segments in the mercury turbine interrupter. This improvement was a result of experiments conducted by a Navy operator named Woberton.

Gradual improvements in receivers were being made. Crystal detectors came into general use replacing electrolytic detectors and coherers. Pickard of Wireless Specialty Apparatus Company developed the IP76 crystal detector receivers. Large quantities of those receivers were purchased to replace obsolescent original equipments. The crystal detector was improved within a few months by B. F. Meissner, a Naval radio electrician, by the addition of the popularly named "cat's whisker," a fine metal point making contact with the crystal.

In 1908, Chief Electrician A. R. Rice installed a new electron tube type detector at Point Loma. This was a three-element "audion" vacuum tube invented by Dr. Lee DeForest. It was a vast improvement over the frail, easily disturbed crystal detector and the insensitive, magnetic-filings coherer then commonly used. Quite a few years were to pass before the crystal type detector was completely replaced by the lusty infant that eventually became the most important component leading to the development of our modern electronic age.

That same year saw the "Great White Fleet," headed by the USS CONNECTICUT, voyaging around the world in a demonstration of the growing U. S. Naval power. Aboard the flagship was Dr. Lee DeForest, inventor of the "audion." Dr. DeForest was engaged in conducting experiments with ship-shore radio telephone communication and Point Loma was one of the stations that participated in those tests.

The DeForest Company's basic endeavor at that time was the development of the radiotelephone. In this effort they utilized a version of the Poulsen arc as a transmitter and a combination of crystal and triode detectors in the receiver. The U. S. Navy, searching for a satisfactory radio system for tactical use, was the company's first customer. In late 1906, they purchased 26 of those equipments and installed them in vessels of the "Great White Fleet" prior to their departure on the 1908 round the world cruise. They were improperly used by naval personnel and for this reason the results proved somewhat less than desired. Although the success of those early radiotelephone tests were not entirely satisfactory, the experiments eventually pointed the way to radio broadcasting as we know it today.

Navy Radio Point Loma established communication with the USS CONNECTICUT while the ship was enroute from Hawaii to New Zealand using the "Massie" type spark transmitter, at a distance of 2,900 miles, another new record for the young station.

In 1905, Poulsen of Denmark developed an arc type, continuous wave transmitter. The Navy purchased two of those equipments in 1907 and conducted experiments with the arc and its associated "tikker" receiver and recommended against their use because of the inadequacy of the receiver. This delayed the Navy's adoption of CW transmissions for approximately four years.

Discovery of the heterodyne method of receiving continuous wave signals provided a vastly improved system for receiving the undamped arc signals. This was made possible by the development of the three element electron tube by Dr. DeForest.

Max Wein of the Telefunken Company developed a quenched-gap spark transmitter. The discharges from those gaps enabled the sparks to follow each other so regularly that a musical tone was emitted instead of the sharp staccato sound of the open spark. Transmission ranges were increased by a reduction in the damping effect. The transmitter tone could be adjusted so that one signal could be distinguished from another. They came into use rapidly as a modification to existing transmitters. Except for the Poulsen arc, this company would have become the Navy's sole source for the procurement of transmitters following 1912.

The year 1912 saw the beginning of the Naval Communication System as we know it today. On the 13th of December of that year the Naval Radio Service was created with a Superintendent in overall charge. Shore stations were divided by geographical considerations into three areas: Atlantic, Pacific and Philippines, each with a superintendent. Initially the Pacific title was Pacific Coast Radio Superintendent. Later that was changed to Pacific Coast Communications Superintendent, then Pacific Communications Superintendent (P.C.S.) and finally Pacific Communications Officer (P.C.O.)

Shortly afterward, due to the coming threat of war in Europe, a special board was appointed to recommend measures required to put the Naval Radio Service in a state of readiness. The board's report led to the creation of the Naval Communication Service under a Director of Naval Communication. When the United States entered into the war in 1917, the Navy took over control of those commercial coastal radio stations needed to maintain Navy communications.

In 1912 the U. S. Navy was directed to use the term "radio" in lieu of "wireless." Naval radio stations were opened to commercial traffic in all areas where commercial radio facilities were non-existent or inadequate.

In 1912 new call signs were assigned to all ship and shore stations. The Navy was assigned exclusive use of the letter "N." The radio station at Point Loma, which had been known to communicators for six years as "TM" was assigned the call sign NFL (Navy Point Loma).

The Washington Navy Yard designed the Navy types A, B and C receivers using the DeForest electron tube. These were completed in early 1915 and placed in production the same year. The Cohen method was used. This consisted of a modified type of feedback circuit to produce oscillations. To avoid use of the term "feedback" it was termed a "tickler" because it tickles the audion and "makes it quiver." These receivers were placed in service at shore stations and on the more important combatar ships as fast as they could be manufactured. However, economy dictated the continued use of the crystal detector, and the heterodyne feature was used only for reception of continuous wave signals.

In 1915 a German type Telefunken quenched-gap spark transmitter was placed in operation at Point Loma and its clear 500 cycle note sounded in sharp contrast to the lower, raspy signals of ships that passed the San Diego area. At the same time, a 30 KW Poulsen arc transmitter was installed at Point Loma making possible direct and continuous communication with the Navy station in the San Francisco area and with Navy ships equipped with similar installations.

The heavy rains experienced in San Diego during the "Hatfield Project" in 1916 burst the Otay Dam and washed out railroad tracks and telegraph lines. (Charles Hatfield, the rainmaker, had made a contract with the city council to fill Moreno reservoir by December 20, 1915. The heavy rains that began on January 15, 1916, were all his doing, he claimed. The city council voted not to pay Hatfield the \$ 10,000 because he had missed the deadline.) With the telegraph lines down, the only communication San Diego had with the outside world was through Navy Radio Point Loma. The radio station provided time for press despatches to the outside. All stories carried the by-line: "via Navy Radio Point Loma."

In order to ensure that the U. S. Naval Radio Service be brought to a peak of readiness and efficiency, a mobilization of communication facilities was ordered for a 40 hour period beginning 6 May 1916. Telegraph and telephone connections were made between the Navy Department and all navy yards and naval radio stations in the U.S. A radiotelephone transmitter had been installed at Arlington for long distance radio telephone tests. Another smaller transmitter and receiver were installed in the USS NEW HAMPSHIRE, in the vicinity of Hampton Roads. Another receiver was installed at the Norfolk Naval Radio Station.

Two way radio telephone communication was established immediately with the NEW HAMPSHIRE via wirelines to the Norfolk station, thence by radio to the ship, and by radio from the ship to Norfolk, thence by wireline to the Navy Department. At sea, off the Virginia Capes, Captain Chandler, commanding the NEW HAMPSHIRE, talked with Captain Bennet, Commandant of the Mare Island Navy Yard and with officers in the Navy Department.

During a telephone conversation with the Navy Radio Station, San Diego, instructions for the USS RALEIGH, then at Corinto, Nicaragua, were issued and relayed via radio in a total elapsed time of four minutes.

In reporting the results of the mobilization, the conversation between the Secretary of the Navy and Captain Chandler was quoted as being the following: "I will be in my office in the Navy Department at ten o'clock tomorrow morning. I will ring you up then and have another conversation. I can hear you as well as if you were in Washington, Captain Chandler. It will not be long before the Secretary will be able to sit in his office and communicate with vessels of the Navy all over the world by wireless telephone. That is something the captains may not like!"

The Navy had purchased a 30 KW arc transmitter that had been installed at Arlington, Virginia. Tests demonstrated effective transmissions of over 1000 miles. Plans had previously been evolved for a system of high-powered stations which would cover all necessary ocean areas and which would be inter-communicable and supported by the existent low-powered shore stations as a secondary system. The successful tests at Arlington convinced the Navy that higher powered arc transmitters should be used for the ocean chain.

An Act of Congress dated 22 August 1912 contained this provision: "Toward the purchase and preparation of necessary sites, purchase and erection of towers and buildings, and the purchase and installation of machinery and apparatus of high-power radio stations (cost not to exceed one million dollars), to be located as follows: one in the Isthmian Canal Zone, one on the California coast, one in the Hawaiian Islands, one in American Samoa, one in the island of Guam and one in the Philippine Islands, four hundred thousand dollars to be available until expended." In later legislation and prior to completion of all high-power stations listed, the authorization of one million dollars was increased to \$ 1,500,000.

Construction of the station at Darien, Canal Zone, was begun in 1913 and placed in commission on 1 July 1915. The 100 KW arc immediately provided a signal easily received at Arlington. The "tikker" receivers were supplemented by Navy designed heterodyne receivers. The successful operation of the Darien transmitter with its increased range made possible a change of plans. It was decided to equip Pearl Harbor and Cavite with 350 KW transmitters capable of communication with each other, thereby eliminating the requirement of relaying through Guam or Samoa. At those locations 30 KW equipments would be installed in the existent buildings and the antennae would be improved to provide sufficient radiation.

The Federal Telegraph Company had refused to guarantee the 100 KW arc for Darien. When asked to construct the 200 KW for San Diego and the two 350 KW for Pearl Harbor and Cavite, they were horrified and again the Bureau had to gamble that they would be successful. The contract for these was signed on 21 February 1916.

The San Diego station was the first to be completed. The site of the Chollas Heights location for the giant transmitter was purchased on 21 July 1914 from Mr. Harry Flavel Carling, and on 7 April 1915, the City of San Diego by grant gave the United States Government perpetual use of city lands at the reservoir for a pump house and water mains.

Contract for the erection of three self-supporting, 600 foot steel towers was awarded on 27 February 1915 and work was completed on 20 January 1916. Contract was awarded to the Jacobs Construction Company of Los Angeles for the construction of a power house, operating building, storehouse, pump house, quarters for the officer in charge, quarters for the chief operator and barracks for operators. Work was completed on 1 March 1916.

Contract for the 200 KW Poulsen arc transmitter was awarded to the Federal Telegraph Company of Palo Alto in 1915. Installation was completed 26 January 1917 and tests began.

Although it did not go into commission until May 1917, the official trials commenced on 26 January when Lieutenant S. C. Hooper, USN, sent the first message to Arlington using a silver key especially prepared for the occasion.

San Diego made quite a celebration over the completion of this station which presented an imposing sight with its three 600 foot towers crowning the hills. On the day before the commissioning ceremony, everything went wrong, and there was a question as to whether the transmitter could be used because of a faulty keying circuit. One of the events was to be a transmission of a message from the new station to the Secretary of the Navy, and the receipt of a reply by the remote receiving station at Point Loma. Hooper, not desiring that the Navy be held in ridicule by the possible failure of the transmitter, telegraphed the Bureau the message he intended to transmit and requested an advance copy of the Secretary's reply be wired him at once. The next morning brought no response. With great trepidation he joined the Mayor, the City Council and other local dignitaries for the trip to Chollas Heights. On arrival at the station he discovered that the reply to his message had been delivered there. He could go through the motion of transmitting and then, after a proper time, he could deliver to the press a message from the Secretary. He breathed a sigh of relief, a very quiet sigh of relief.

The hour appointed for the station's first official transmission arrived. Hooper took his seat at the keying position and began transmitting his message. To his astonishment, the huge relay key obeyed the commands of its tiny counterpart, and the transmitter was on the air. The Federal engineers, assisted by the station personnel, had labored long into the night checking and rectifying, rechecking and testing. One minute passed with no reply being received. Two minutes and the operator, connected by landline to the receiver at the remote receiving station, commenced writing. In another minute he handed Hooper a folded message which he, in turn, handed to the Mayor for that dignitary to read aloud to the assemblage. As the Mayor read, Hooper secretly checked it with the advance copy. Willy Secretary Josephus Daniels had added an additional question which required a further reply.

Upon his return to Washington, Hooper was directed to the Secretary's office. As he stepped into that dignitary's office he was greeted with the remark: "That was trickery, Hooper! I didn't like it at all!" The expected reply was: "Aye Aye Sir," and the incident was closed.

Meanwhile, construction of the stations at Pearl Harbor and Cavite was proceeding. The war caused delays in the fabrication of the towers and those for Cavite were further delayed by the British seizure of the ship carrying them. The towers were finally released after prolonged diplomatic negotiations. Pearl Harbor was placed in commission 1 October and Cavite on 19 December 1917.

Construction of the transpacific chain had necessitated overcoming many obstacles and the taking of numerous calculated risks. NRL radio engineers had claimed that the antenna voltages would be more than the existing insulators could withstand and that the corona would prevent efficient radiation. When the Federal Telegraph Company submitted a plan requiring chains of interlocking porcelain insulators, each approximately 15 feet long and at a total cost almost equal to that of the transmitter, LT Hooper asked the Locke Insulator Company to design a practical strain insulator for the purpose. To the great credit of the company, they developed a practical insulator with metal corona shields which could be installed on the wings of the towers. Use of those insulators made it possible to increase the output power of the Pearl Harbor and Cavite transmitters to 500 KW.

After the chain of high powered arc transmitter stations was completed the initial plan was to route message traffic from Washington (NSS) through Balboa, Canal Zone (NBA) to San Diego (NPL) thence to Honolulu (NRM) and on to Cavite (NPO). Direct communication between Cavite and Honolulu proved to be unsatisfactory on a twentyfour hour basis and it was necessary to enlist the aid of Guam (NPN) to relay traffic between those points.

The early arc transmitters were crude devices. The means of keying them was by short circuiting some of the turns of the antenna helix or by changing the capacity of the antenna. Either of those methods caused a change in the emitted frequency. Thus, at the time a signal was being transmitted, the antenna emitted one frequency and when the key was up, i.e., no signal being transmitted, another frequency, called the spacing or compensating frequency, was being emitted. In 1916, Eaton devised a multi-contact key which provided one contact for each turn of the helix. This solved the keying problem but did not eliminate the compensating frequency. In addition to the compensating frequency, the arc also emitted numerous harmonics of both the transmitting and the compensating frequencies and, additionally, its tone was quite mushy. With the reactivation of amateur activities after the war in 1919 and the advent of broadcasting in 1921, considerable criticism was justly leveled at the Navy because of the interferences they caused.

The Federal Telegraph Company, Gunner Kenny in the USS OHIO, Cohen and Eaton at the Radio Test Shop all worked on the development of a uniwave key. Eaton developed a satisfactory keying system which utilized a bank of noninductive resistance units between the transmitter and the antenna, and an absorbing circuit, thus eliminating the compensating frequency. Radio Aid Hallborg devised a system to couple the arc to a rejector circuit in series with the antenna. This effectively eliminated the harmonics and mush.

On 1 October 1920, the 200KW arc transmitter at Chollas Heights was converted to a uniwave keying mode and the Hallborg circuit installed. Conversion was done by personnel from the Mare Island Navy Yard under the supervision of Gilbert W. Cattell, Radio Engineer, assisted by Radio Inspector A. J. Hodges.

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On the outbreak of war in 1917 a military fence was erected on the north side of the station at Point Loma and a detachment of Marines was assigned to the station. The Marines were withdrawn in 1919. On 15 July 1917, a company of Marines from the 5th Regiment was assigned to the Chollas Heights station, a military fence was erected, electrically charged and flood-lighted, and the station grounds were closed to the public. The Marines were withdrawn on 30 June 1921.

The years during World War I saw a rapid rise in the amount of traffic handled by Radio San Diego and a need for more operators and operating spaces. To overcome this difficulty the radio receivers and transmitter control facilities were moved to North Island in 1918. The 30KW arc and the two small spark transmitters at Point Loma and the 200KW arc transmitter at Chollas Heights were keyed by landline from the North Island operating center.

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We are unable to locate records of the exact date when the San Diego - Washington circuit was established. Relay through the Canal Zone to San Diego was a round-about way of forwarding message traffic. Washington did not initially have an arc transmitter with sufficiently high power to penetrate the overland distance to San Diego. A VLF, high powered (350KW) arc transmitter was commissioned at Annapolis, Maryland (NSS) in 1918. We can safely assume that a San Diego - Washington circuit was established at about that time.

San Diego had to share the use of the 200KW arc transmitter at Chollas Heights between the Washington and the Honolulu circuits. With the increase in the number of Naval vessels in the Eastern Pacific, it became desirable to institute an intercept

broadcast circuit to the fleet. San Francisco installed an arc transmitter at Mare Island in 1920 and established a direct circuit to Honolulu. From that time, message traffic from the far east was routed through Cavite to Honolulu to San Francisco to San Diego and on to Washington. That was the traffic situation between about 1920 and until 1925 or 1926, according to several members of the Old Timer Communicators organization, including Grant Horsley, James W. Jones, Marlo G. Abernathy and Georg Dayton Alverson. They all had been stationed at NPL at some time during that period.

When San Francisco took over the Honolulu transpacific circuit from San Diego, an intercept broadcast circuit was instituted between San Diego and Honolulu using the 200kw arc at San Diego and the 500kw arc at Honolulu. Schedules were conducted every other hour, except 2200, with San Diego transmitting numbered HYP0 messages for the first fifteen minutes. Honolulu would then repeat back (G) those messages for the second fifteen minute period. Honolulu would transmit numbered PREP messages for the third period and San Diego would repeat them back for the final period. This broadcast method enabled ships at sea to have two chances to receive their messages without having to use their transmitters to receipt for the traffic.

The San Diego - Washington circuit handled all of the Navy and other Government departments' message traffic to and from the far east. Communication conditions on that circuit were often poor due to static and weak signals. James W. Jones, one of the NPL-NSS operators, states that every effort was made to clear all traffic during the good-signal, night hours, to avoid the expensive forwarding of left-over traffic via Western Union, Postal Telegraph or Mackay Radio and Telegraph companies the next morning when circuit conditions worsened.

We have been unable to learn the exact date when San Francisco established a direct circuit with Washington. San Francisco never did have a really high powered arc transmitter, so we can only assume that the San Francisco - Washington circuit was established after long-distance, high frequency communication became practicable. The Point Loma history records show that no STATE DEPARTMENT traffic was handled by Point Loma after 1924, yet considerable commercial traffic was handled through 1926 with a sudden cut-off of commercial traffic after that year.

Point Loma history records for the year 1927 state: "This station is not a user of the transpacific or transcontinental circuits but is primarily to handle traffic to and from the fleet. Intercept schedules are maintained with Hawaii and the Canal Zone. Continuous schedule is maintained with San Francisco." We have been unable to locate any further records of the San Diego - Canal Zone intercept circuit.

Between 1918 and 1921, the Mare Island Navy Yard supervised the construction of a chain of direction finder stations along the West Coast from Alaska to San Diego. The stations at Point Arguello, Point Hueneme, Point Fermin and Imperial Beach were turned over to the operational control of the Eleventh Naval District when that District was established in 1921. We have been unable, at this date (1984), to locate any historical records of those stations. It is possible that the station records were retained by the Coast Guard when they took over operational control in about 1944.

A direction finder (compass) station was erected near the beach of the Point Loma station in 1920. The site proved unsatisfactory and was abandoned in 1921. The building was dismantled in 1925.

On 15 May 1920 the 30KW arc transmitter was removed from Point Loma and installed at the Chollas Heights station. The Control Station at North Island was abandoned and the receiving equipment was installed at Point Loma. Point Loma became the receiving and control station, keying the transmitters at Chollas Heights by landline.

On 1 April 1922 the 1KW and the 5KW spark transmitters were removed from Point Loma and installed at Chollas Heights.

In May 1922 the Naval Supply Depot Building at the foot of Broadway in San Diego was completed. District Headquarters moved from North Island to its present site. The control facilities at Point Loma were moved to San Diego and Point Loma was converted to a radio receiving and monitoring station. The received radio signals were connected, by telephone landline, directly to operating positions in the new Eleventh Naval District Headquarters. Those operating positions were also connected by landline to the transmitters at Chollas Heights thus providing complete remote control of both receivers and transmitters from San Diego.

The Registered Publications System first entered the Navy in 1923 under the direction of the Chief of Naval Operations. In San Diego, the issuing of publications was handled by one issuing officer, CDR Shearer, who was assigned to the office of the District Communication Officer. He occupied a small space with a vault on the mezzanine floor of the headquarters building. This is the same space that housed the Naval Communication Station's publications in 1971. As the number of publications increased so did the number of people working in the issuing office. In 1939, separate issuing facilities were formed for Registered Publications. This marked the start of expansion which proceeded quite rapidly. By 1944, when the RPS system reached its peak, its office was located in the space later occupied by the Armed Forces Courier Services. In 1947 another move was made to accommodate the speedy growth of RPIO. The office was then moved to Building 110 on the Supply Center compound. This building was sufficient for about nineteen years when still another move was necessary. On 9 May 1966 a new RPIO building was dedicated at the Naval Station. In 1971 RPIO was one of the thirteen issuing offices ashore and afloat. It was responsible for the distribution of registered publications to the fleet and shore units. The office utilized a total of twentyfive military and civilian personnel and served approximately 250 Naval units each month.

On 15 June 1924, a Radio Material Shop was established at the Chollas Heights station and these civilian personnel were transferred from the Navy Yard Mare Island: H. C. Thamsen, Machinist; H. W. Davis, Electrician; F. A. Best, Joiner and O. Rasmussen, Rigger.

The first electron tube type transmitter used by Radio San Diego was installed at Chollas Heights on 1 July 1924. This was a one kilowatt transmitter designed by General Electric and manufactured by the Mare Island Navy Yard. It was designated model "TD," with a frequency range from about 100 to 600 Kc. The 1KW and the 5KW spark transmitters were converted to ACW tube transmitters, similar to the TL, TM, TN and TO transmitters.

Public Law No. 264, approved 13 August 1912, required all amateur stations to utilize frequencies higher than 1500 Kc. As a result, the amateurs were the first

to experiment with "short wave" equipments. In the early 1920's much success had been achieved in long distance communication using those higher frequencies. The Naval Research Laboratory was constructing experimental high frequency transmitters and receivers. Shore stations were encouraged to construct similar equipments using newly designed power vacuum tubes and using power sources from existing spark transmitters.

A 100 watt, short wave transmitter was built by the Chollas Heights RMO Shop and completed on 15 February 1925. It was designed to operate on frequencies from 4000 to 9000 Kc. Although there are no records of the operational employment of this transmitter, it is possible that it was used during the first Navy high frequency tests with the Pacific Fleet during the 1925 Australian cruise.

The first crystal controlled, high frequency transmitter was completed by the Naval Research Laboratory in late 1924. A one-way circuit was established between Washington and Balboa. Within a month, additional, one-way, night time circuits were established with London, San Diego, San Francisco and Honolulu.

During this period radio amateurs already numbered in the thousands and they were increasingly interested in using the higher frequencies.

During early 1925, the Fleet was preparing for a cruise to Australia. An experimental installation was made in the Fleet flagship, the USS SEATTLE, consisting of a Laboratory transmitter operating on 5700 Kc and one of the newly designed high frequency receivers, the RG. Additionally, RG receivers were installed at San Francisco, San Diego, Honolulu and Balboa. The American Radio Relay League (an amateur organization), made arrangements for cooperation of amateurs all over the world. Numerous tests were conducted during the cruise. During best transmission hours, 2330-0800, zone plus five time, little difficulty was experienced in handling direct communication with Washington, even during the period when the Fleet was in Melbourne, nearly 10,000 miles away.

Following those tests, the Commander in Chief recommended the addition of high frequencies to the fleet frequency plan and that shore stations be equipped to transmit to the fleet on frequencies not higher than 9000 Kc. The Bureau disregarded the latter and immediately made plans to equip 28 shore stations with transmitters and receivers with an upper frequency limit of 18,000 Kc.

* * * * *

In 1925, it was decided to discontinue the remote control operation of the transmitters and receivers from the Eleventh Naval District Headquarters at the foot of Broadway in San Diego. Control facilities were moved to Point Loma and that station again became the central point of Radio San Diego operations. A landline circuit to District Headquarters in San Diego provided a channel for message traffic for the Commandant's business and for other activities in the San Diego area. Lacking detailed records, we can only surmise that this move was made when the San Diego - Washington circuit was discontinued and that task was assumed by Radio San Francisco.

* * * * *

The Naval Communication Frequency Plan was approved early in 1926. Very low frequencies plus frequencies between 4000 and 4525 Kc and the harmonics thereof were assigned naval shore stations. Once the decision to utilize the higher frequencies was made, there were no further major changes made in the modernization plan.

Harmonic operation of the earlier equipment was far from satisfactory and most of the transmissions were confined to the fundamental frequencies. Later, LCDR J. B. Dow, USN, designed an electron-coupled circuit that made utilization of the harmonics practicable.

Development of 20KW very low frequency vacuum tube transmitters with a performance equal to the 100KW arc transmitters gave indication that the latter type, in which the Navy had invested millions of dollars, would soon be obsolescent, however, economy dictated their continued use until such time as they became uneconomical to operate. In the meantime higher powered very low frequency vacuum tube transmitters were being developed to eventually replace all of the arc transmitters.

* * * * *

The first very low frequency, high powered vacuum tube transmitter to be used at Chollas Heights was an 80KW monster installed in early 1926 under the supervision of CHRELE J. P. Richardson, USN. From the very beginning this transmitter was plagued with troubles. The first two months of testing produced 40 tube failures. The water cooling system for the large transmitting tubes was a continual headache. Finally, through the perseverance of the General Electric engineers and the station personnel, the "bugs" were eliminated and the "monster" took its rightful place with the rest of the transmitters. Full power official test was started on 5 March 1927 and completed on 19 March 1927. The 80KW tube transmitter replaced the 200KW arc transmitter on the VLF circuits.

* * * * *

Bureau plans called for spark transmitters to be eliminated from future consideration. The Bureau also had to determine: Whether low-powered, high frequency transmitters would render service ashore and afloat, equal or superior to that rendered by the high-powered, very low frequency arc transmitters then installed; whether the VLF tube transmitters should be used to replace the reliable, rugged arcs which were still capable of rendering service to the fleet, and whether, presuming that the tube transmitters were to become standard, the arcs be still further refined to render them capable of meeting requirements of standby transmitters.

Design and development of improved vacuum tube transmitters and receivers proceeded at an accelerated pace. A program for modernizing shore radio stations was carried out. Models TAB-1, TAB-2 and TAB-3, TAD-1 and TAD-2, TAF-1 and TAF-2, TAJ-1, TAQ, TAS and TAT were installed as required at those stations. In the fiscal year 1930, 9 TAB-4, 2 TAW, 10 TAY and 13 XJ-2 were purchased specifically for shore stations.

In 1931, RCA was given a contract for 227 Model RAA (10-1000 Kc) and 163 Model RAB (1-30 Mc) receivers. These were the first alternating current receivers. They were installed during the fiscal year 1932. NRL had previously, in 1930, designed the Model RAC low frequency (12-80 Kc) barrage receiving equipment for shore stations.

Following delivery of the Models RAA and RAB receivers and concurrent issue of Models TAU, TAZ, TBE and TBC transmitters, which had been purchased in 1931, the U. S. Navy possessed the most modern and efficient radio system of any navy.

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Chollas Heights received and installed their share of those transmitters. A Model TAB-1 was installed on 1 August 1927, Models TAB-2, TAD-1 and TAF-1 on 2 January 1928. On 15 September 1930, a Model TAE transmitter (Ex-USS SARATOGA) was installed after it had been modified by the RMO Shop for operation on AC, on a frequency of 58 Kc. At that time the 30KW arc transmitter was placed in a standby condition. Additional transmitters were added at Chollas Heights over the years including Models TAK, TBK, TBO, TAQ, TBC (the high powered high frequency transmitter), TRM, TDH, TAX, TBM and TBO - and others.

Point Loma was concurrently modernized by the addition of Models RAA, RAB and RAC receivers to replace or augment the Models RE, RF and RG receivers then in use.

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Point to point radio circuits connecting area stations naturally handled large amounts of radio traffic. To expedite this handling, the use of the so called "automatic radio telegraph equipment" was instituted. This was a form of high speed (100 words per minute or faster) keying and recording mechanisms which had been designed and developed in 1924. The first equipments were installed at shore stations.

The equipments consisted of Kleinschmidt keyboard Morse tape perforators, Boehme high speed tape keying machines and sensitive ink recording devices. The keyboard perforator prepared a thin slip of paper tape with perforations representing the dots and dashes of the signal intelligence. This tape was placed in the Boehme tape sending machine which scanned the perforations and automatically keyed the remote transmitter accordingly. At the receiving end of the circuit the signals from the radio receiver actuated an ink recorder which inscribed the dots and dashes on moving paper tape. The receiving operators, in addition to attending the recording equipment, transcribed those ink recordings on message blanks with a typewriter by visually reading the inked tape. This system greatly increased the speed of traffic on point to point radio circuits, however it was still subject to failure when noise, interference and poor receiving conditions made tape illegible. Under those conditions it was necessary to resort to hand sending until the circuit improved.

High frequency signals have a natural fading quality. To provide a constant signal to automatic recording devices from those fading signals, the Navy designed a diversity receiving system utilizing three separate antennae, individually spaced and oriented, each feeding into a separate receiver. The output of each receiver actuated a common audio tone keyer. Received signals seldom faded in all three receivers at the same time. A constant tone output was usually obtained from the keyer unless receiving conditions were exceptionally poor due to signal skip. At those times the sending station was usually directed to shift to another harmonic frequency to improve the signal. The control/receiving station could monitor the audio tone signal from the diversity receiving station for manual reception and/or feed the tone signal through a demodulator, convert it into an electric impulse to actuate the arm of the inked pen and produce the dots and dashes of the received signal. Operators, with practice, soon became proficient in transcribing messages from the paper tape which could be fed through slots in front of a typewriter at speeds controlled by a foot-pedal rheostat.

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As the volume of traffic increased it was determined that facilities at the Point Loma station were inadequate. A large concrete operations building was planned and construction started. This building provided a great improvement over the older installation in that it centralized the operating facilities. The building contained spaces for the battery room, main operating room, landline room, high speed operating room and offices for the Radioman in Charge and the Communication Chief. This new operating center was officially commissioned in 1930.

The intercept broadcast schedules with Radio Honolulu were discontinued in 1932 and replaced by a FOX broadcast by Radio Point Loma. The schedules were hourly except at 2200, which was reserved for a schedule with Radio Balboa, Canal Zone. Point Loma continued this broadcast up through the start of World War II.

In 1933 the Naval Air Station at North Island also started using the Chollas Heights transmitters by remote control over landlines. A number of smaller transmitters were removed from Chollas Heights, in the interests of economy, and reinstalled at Point Loma and North Island. Shortly before World War II those transmitters were restored to their original site at Chollas Heights.

On 19 November 1934 modification of the 80KW VLF tube transmitter was started by the RMO Shop under the supervision of H. M. Crosby, General Electric engineer. This modification, increasing the output of the transmitter to 100KW, was completed under contract No. 35181 on 11 February 1935.

On 16 October 1937 the Model TAE transmitter was placed in an inoperative status on orders from the Bureau of Engineering.

From April to July 1939, the 200KW arc transmitter was dismantled by the RMO force. The arc was donated to the California Institute of Technology and was removed by personnel from that activity.

On 10 November 1939, the Model TAE transmitter was dismantled and shipped to Mare Island for reinstallation.

Early in 1940, construction of the Navy Radio and Sound Laboratory was started on a corner of the Point Loma site. The first building was completed 21 August 1940 and the laboratory was officially commissioned, with Commander Jennings B. Dow, USN, as officer in charge. The name was changed in 1945 to Navy Electronics Laboratory.

Major fleet units of the U. S. Navy arrived in the Pacific in 1939. A program to mobilize communications was necessary as the Pacific system of Naval communications was inadequate to serve the large fleet. A world wide communication system was created based on the installation of high power radio transmitting stations at strategic locations in the United States and its possessions. The FOX broadcast method of communication was used. This method not only provided a world wide coverage but also eliminated the necessity for individual ships to break "radio silence" to acknowledge receipt of messages. A message originating in Washington would be routed to the station serving the particular area in which the ship concerned was operating. This ship would be copying all messages transmitted from that station and would therefore be sure to receive all messages addressed to its commanding officer. The very low frequency broadcast schedules from Washington, Pearl Harbor and Balboa were completed and integrated in 1940. At that time the San Diego FOX broadcast was downgraded to serve only fleet units in the proximity of San Diego.

San Diego was designated as the "alternate" FOX broadcast station to be guarded by all eastern Pacific fleet units whenever Radio Honolulu was off the air during routine maintenance or casualty to the Honolulu transmitter.

The Pacific casualty plan included a provision for CINCPAC to key the San Diego VLF transmitter on 30.6 Kc by remote control for direct broadcast to the fleet. It also designated San Diego as the alternate station on the transpacific and transcontinental circuits in the event of casualty to Radio San Francisco.

Diversity antennae had been erected at the Point Loma station oriented toward the Pacific and toward Washington. Two bays of Model RAS diversity receivers, mixers and keyers had been installed.

On Saturday afternoon, 6 December 1941, Point Loma received a despatch from Radio Honolulu requesting that Point Loma take over the FOX broadcast to the fleet at 0800 PST, Sunday, 7 December. The Radio Honolulu transmitter station at Lualualei was scheduled to make a major transformer or other electrical change which would normally take all day.

At 0800 PST on Sunday, Point Loma assumed the FOX broadcast to the Pacific Fleet on 30.6 Kc using the 100KW VLF transmitter at Chollas Heights. Most of the traffic for this broadcast was received on the manual circuit from Radio San Francisco. Traffic on that circuit averaged about 600 messages daily.

At about 1000 PST, the Supervisor of the watch at Point Loma, Chief Radioman Wendell L. Fraser, notified LT Wayne Prather, Officer in Charge, that an urgent despatch had been received for broadcast to the fleet: "Japanese planes attacking Pearl Harbor x This is no drill."

LT Prather immediately went to the operating building, called LCDR Wright, the Assistant District Communication Officer. (COMDR Grimes, the District Communication Officer was on temporary duty in San Francisco.)

All hands living on the station were called and assigned to additional circuits. Personnel living off the station were called but most of them reported for duty without notification. A two section watch was set to handle the increased traffic.

A watch was immediately set on CINCPAC high frequency circuits according to the casualty plan. Another watch was set on Radio Honolulu high frequency circuits. CINCPAC signals were never heard. Radio Honolulu signals were heard on the San Francisco circuit, but no attempt was made by Radio Honolulu to contact Point Loma, apparently because of the need for that circuit to forward urgent despatches to Washington.

After the Radio Honolulu (Lualualei) VLF transmitter was back on the air, CINCPAC directed the simultaneous keying of the San Diego and Honolulu VLF transmitters. Point Loma received the Honolulu signals on the Model RAC VLF barrage receiver and fed them through an electronic keyer to the transmitter at Chollas Heights. The rebroadcast worked very well from the start and continued for approximately 60 hours.

A letter of commendation from the Commander in Chief, Pacific Fleet, was later received by the Commandant, Eleventh Naval District. The District Communication Officer, with a copy of the CINCPAC letter enclosed, commended LT Prather of the Point Loma station and ENS. M. W. Palmer of the Chollas Heights station for their actions during the emergency, and directed them to furnish the DCO with the names of all personnel at both stations who were directly involved with the rebroadcast tasks so that copies of the letters of commendation could be entered in their service records.

The war years of 1941-1945 were busy ones for Radio San Diego with the overall message traffic reaching its peak in 1945. This period saw the installation of a wide variety of communication and control equipment. Teletype machines were installed to provide a rapid method of communication using operators whose only skill was the art of typing. Modern high power high frequency transmitters and the latest type of high frequency diversity radio receiving equipments were installed. A complex communication control system using very high frequency radio circuits that connected the various station components was created. Through the use of telegraph and telephone multiplexing equipment those control radio circuits eliminated the need for many of the landlines previously used for remote control between, Point Loma, Chollas Heights, North Island and District Headquarters.

In September 1942, the Radio Honolulu FOX broadcast became saturated. A "West Coast" FOX broadcast for vessels in the eastern Pacific was initiated with Radio San Francisco as control station. San Francisco keyed the 100KW VLF Chollas Heights transmitter and other transmitters at Mare Island simultaneously by remote control over landlines.

Landline teletypewriters were replacing many of the radio circuits within the continental United States. A teletypewriter circuit was added between the Eleventh Naval District Headquarters and the Communication Center in San Francisco replacing the former radio circuit at Point Loma. As the war progressed, additional circuits were added to provide for communications with the burgeoning activities in the district.

Reperforators were perfected which simultaneously provided a perforated tape of a received message which could be used to retransmit the message to another activity without the need to retype the message on another teletypewriter. Soon "turn tape" relay centers were established at major activities. Automatic tape relay was provided on some circuits and semi-automatic on others.

Primary - NTX - relay centers were established in San Francisco and Washington. San Diego was designated as a major relay center with two full time circuits with San Francisco and with other circuits to every other activity in the district. The San Diego relay center was established on the third floor of the headquarters building in San Diego.

At this time, the Point Loma station had no overseas or transcontinental radio circuits. San Francisco had taken over control of the VLF transmitter at Chollas Heights for the "West Coast" FOX broadcast, and other continental radio circuits had been replaced by teletype circuits at District Headquarters. The Coast Guard had taken over responsibility for guarding the 500 Kc distress frequency and control and operation of the direction finder stations at Point Hueneme, Point Fermin and Imperial Beach. This left Point Loma in an inactive "standby" status.

In 1941, 145 acres of additional land had been acquired at Imperial Beach to construct a new receiver site. To enable the growing Navy Electronic Laboratory to expand, the disestablishment of the Point Loma station began in 1947 as receivers were transferred to Imperial Beach. The radio station at Imperial Beach, commissioned in 1920 as a direction finder station to provide navigational aids to ships at sea, became known as Naval Radio Station (R), Imperial Beach. This site was selected because of its topographical features which allowed for more efficient, highly directional antennae to provide for close channel spacing in the radio frequency spectrum.

In 1947, the Navy Radio Stations at Chollas Heights and Imperial Beach were consolidated with the Communication Center. The command was designated the Naval Communication Center, Eleventh Naval District.

The post war years brought a great decrease in the amount of message traffic handled and once more NFL settled back to a peacetime communication organization. At the same time the growing pains being experienced by the embryonic Navy Electronics Laboratory at Point Loma dictated the necessity for relinquishing the land and buildings at the Point Loma Radio Station in order that the Laboratory could reach full growth and thus be capable of coping with its ever increasing responsibilities.

On a sunny day in June 1949, Mr. R. B. Stuart the original creator of Radio Point Loma and by this time a senior electronics engineer for the Long Beach Naval Shipyard, lowered the flag at the Point Loma Station for the last time. Rear Admiral W. D. Baker, USN, Commandant, Eleventh Naval District, directed the decommissioning ceremonies and recounted some of the accomplishments and highlights of the old Point Loma station. The station flag was given to CDR Wayne Prather in recognition of his service as Officer in Charge during the dark Pearl Harbor days.

In 1948, the Navy established a training activity for communications personnel at the south end of the Imperial Beach facility in a single small building. Initially, no more than 50 students were enrolled at one time. At the height of the school's existence, this number had grown to more than 1000 trainees. By this time there had developed a sizeable physical complex which included a number of class and office buildings, a theater, bowling alley, barracks, etc. In 1961 the school was relocated to Pensacola, Florida.

In the fifties, Navy Radio San Diego went through another series of evolutionary changes of growth and expansion. In 1952 the Navy added 412 Imperial Beach acres to further expand the receiver site.

In 1953, The Naval Communication Station, Eleventh Naval District, was redesignated as the Naval Communication Station, San Diego.

In 1957, the Naval Communication Station, San Diego, was designated as a Major Teletype Relay Station. 82B1 electromechanical relay equipment was installed.

In 1965 a new antenna and building was installed at the Imperial Beach station. A giant "cage" or "fence" completely encircled the new building. The "fence" is really a specially designed antenna called a WULLENWEBER named after the two German scientists who developed it. Originally designed as a direction finding antenna, the antenna is also used to support the general service receiving functions.

The WULLENWEBER antenna is composed of two concentric antenna arrays each backed by a reflecting screen. An important capability of the antenna is to beam or sector, i.e., to use only that portion of the antenna that is receiving the strongest signal thus blocking out extraneous signals and interference to a significant degree.

The new building and antenna were constructed at a cost of \$1,592,726 by the Fischback and Moore Construction Company. Construction started in July 1964. Later the perimeter fence was installed around the entire station. By September 1964, the construction of the building, which now houses all station operations, was underway. The frame for the WULLENWEBER and the second floor of the building were completed by November. The next nine months were spent running wire, transferring equipment from the old building and testing the systems.

By 1900 all previously existing buildings on the Imperial Beach site were torn down with the exception of the concrete underground gun emplacements and four family quarters. This was necessary to prevent interference with the complex WULLENWEBER antenna and its associated equipment. A familiar landmark to San Diegans, the "dinosaur cage" is visible for miles at sea and when traveling south or west toward Imperial Beach. This interesting, cage-like structure surrounds the building which today houses the communication station's radio receivers and direction finding equipment.

A dramatic change in communications occurred in 1966 when the Naval Communication Station San Diego became a part of the world-wide AUTODIN (Automatic Digital Network) system. Torn tape relay stations were replaced by a global network of computers capable of secure, virtually error-free message transmission at extremely high speeds. AUTODIN, with over 3000 directly connected interservice subscribers, has the capacity to handle approximately five million messages daily. Ninety percent of all FLASH precedence messages can be processed in less than six seconds and seldom does the system take over 20 minutes to process the lowest precedence traffic. Reliability is not sacrificed for speed. The probability of a message not being switched to its proper destination after entering AUTODIN is less than one in ten million.

San Diego's entrance into AUTODIN was originally by IBM 360/20 computer. Several generations of computers have come and gone. A UNIVAC 70/45 LDMX (Local Digital Message Exchange) was installed at NTCC (Navy TeleCommunication Center) San Diego in 1975 and the second LDMX was installed at NTCC North Island in 1980.

In 1967, one million messages were handled by the Naval Communication Station, San Diego.

1968 saw the installation of an IBM 360/20 computer at Headquarters to provide a high speed communication link.

In 1969, the Naval Communication Station, San Diego, was awarded the Navy Meritorious Unit Commendation for outstanding service during the period 1 July 1967 to 31 May 1969.

In 1971, the site of the receiver station, located 16 miles south of San Diego, was renamed Naval Radio Receiving Facility, Imperial Beach, after having been known for years as Naval Radio Station (R).

In 1972, a UNIVAC DCT-9000 high speed multi-media AUTODIN terminal was installed at Headquarters replacing the IBM 360/20.

During the period 1973 to 1976, the station expanded its sphere of influence to include all communication facilities in Southern California. Through a series of consolidation efforts directed by the Joint Chiefs of Staff, the Chief of Naval Operations and Commander Naval Telecommunications, thirteen communication centers located at Point Mugu, Port Hueneme, Corona, Seal Beach and the greater San Diego area were consolidated under the management and operation of Naval Communication Station, San Diego.

In 1975, a high power complex of communication computers was installed at Headquarters. These latest equipments are called the Local Digital Message Exchange (LDMX). The LDMX is a series of five separate computers integrated into a central complex which is capable of assuming nearly all message processing tasks. This complex replaced the DCT-9000 terminal at Headquarters. The automation of services and functions has resulted in the virtual elimination of manual message processing functions and its inherent delays and errors. Since its inception, the LDMX system processes an average of one million messages every six months. It passed the ten million mark in January of 1981.

In 1977, a UNIVAC DCT-9000, AUTODIN terminal was installed at the NTCC Long Beach replacing the IBM 360/20. NTCC Annex, Seal Beach, and NTCC Annex Corona were established as direct subscribers to the San Diego LDMX.

In 1978, a UNIVAC DCT-9000 terminal was installed at NTCC Point Mugu as a remote terminal of the San Diego LDMX.

In 1978, the bachelor enlisted quarters at Chollas Heights was closed and the transmitter site was prepared for eventual turnover for contract operations.

1979 saw the preparation of a site for the NTCC North Island LDMX installation and the Technical Control low-level conversion. A SUNS OCR (optical character reader) was installed at Long Beach.

The LDMX at North Island became operational in 1980 and the first San Diego RIXT (Remote Information Exchange Terminal) system became operational at NTCC Silver Strand.

RIXT terminals were installed and activated at NTCC Point Mugu and NTCC Miramar in 1981. A DCT-2000 was installed and activated at NTCC 32nd Street. Planning commenced for installation of a second 70/45 AUTODIN terminal at NTCC North Island.

A RIXT system at the Marine Corps Base, Camp Pendleton, that is directly connected to the LDMX at NTCC San Diego, was activated in 1982. A new DBX (Digital Branch Exchange) switch board was installed in Technical Control and two major LDMX program changes were made.

1983 saw the transfer of the Naval Radio Transmitting Facility, Chollas Heights, from Navy to contractor operation. Also the development of plans for installation of a UNIVAC 90/60 computer to replace the current UNIVAC 70/45 and the installation of a Parkhill Voice System in Technical Control.

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DISTRICT COMMUNICATION OFFICERS
Eleventh Naval District.

1921	-	1924	LCDR J. M. Ashley
1924	-	1927	LCDR H. B. Berry
1927	-	1928	LCDR A. C. Thomas
1928	-	1931	CDR E. B. Woodworth
1931	-	1933	LCDR L. B. Gray
1933	-	1935	LCDR T. B. Inglis
1935	-	1937	CDR C. D. Edgar
1937	-	1940	CDR J. A. Terhune
1940	-	1941	CDR J. L. Allen
1941	-	1943	CDR W. F. Grimes
1943	-	1944	CDR F. L. Eley
1944	-	1945	CDR R. C. Lawver
1945	-	1947	CAPT J. W. Murphy

COMMANDING OFFICERS
Naval Communication Station, San Diego

1947	-	1949	CAPT C. C. Ray
1949	-	1951	CAPT L. E. Ruff
1951	-	1954	CAPT T. R. Kurtz, Jr.
1954	-	1957	CAPT W. H. Farmer
1957	-	1958	CAPT T. R. Kurtz, Jr.
1958	-	1960	CAPT T. S. Webb
1960	-	1961	CAPT M. Hamm
1961	-	1962	CAPT A. R. Josephson
1962	-	1965	CAPT R. D. Hawley
1965	-	1967	CAPT R. W. Zimdars
1967	-	1969	CAPT C. T. Babcock
1969	-	1969	CAPT W. G. Chartier
1969	-	1972	CAPT C. F. Wahl
1972	-	1974	CAPT W. M. Shaver
1974	-	1976	CAPT R. M. Stanley
1976	-	1979	CAPT R. B. Browning
1979	-	1981	CAPT B. L. Cloud
1981	-	1983	CAPT R. J. Rice
1983	-		CAPT D. E. Nolan

U. S. NAVAL RADIO STATION (T) CHOLLAS HEIGHTS
San Diego, California

OFFICERS IN CHARGE

1. 1917-1918 FANNING, W. N., Gunner, USN
2. 1918-1919 RODMAN, H. L., Gunner, USN
3. 1919-1921 MUNSON, J. A., Gunner, USN
4. 1921-1923 FREDERICKS, J. E., Chief Gunner, USN
5. 1923-1925 BUCHNER, C. R., Chief Gunner, USN
6. 1925-1927 RICHARDSON, J. P., Chief Gunner, USN
7. 1927-1929 JUSTICE, R. W., Chief Radio Electrician, USN
8. 1929-1931 KREUGER, E. J., Chief Radio Electrician, USN
9. 1931-1933 PRONIER, A. B., Chief Radio Electrician, USN
10. 1933-1935 PHILLIPS, Byron, Chief Radio Electrician, USN
11. 1935-1937 MORLEY, W. R., Chief Radio Electrician, USN
12. 1937-1939 DESROSSIERS, J. E., Chief Radio Electrician, USN
3. 1939-1941 THOMAS, D. N., Chief Radio Electrician, USN
14. 1941-1945 PALMER, M. W., Ensign, USN (10-15-41 to 11-30-45)
15. 1945-1946 CALLAGHAN, J. G., Lieutenant, USN (11-30-45 to 12-1-46)
16. 1946-1947 . STERKEN, O. W. Jr., Lieutenant, USN (12-1-46 to 6-15-47)
17. 1947-1948 BUNCH, J. V., Lieutenant, USN (6-15-47 to 12-1-48)
18. 1948-1949 CIARLETTA, D. A., Lieutenant, USN (12-1-48 to 10-21-49)
19. 1949-1953 LOVE, R.C., Chief Radio Electrician, USN (10-21-49 to 1-9-53)
20. 1953-1955 SKINNER, W. L., Lieut. Commander, USN (1-9-53 to 4-27-55)
21. 1955 HOGAN, L. T., Lieutenant, USN (4-27-55 to 6-30-55)
22. 1955 ELDRED, F. H., Chief Radio Electrician, USN (6-30-55 to 7-22-55)
23. 1955 WILLIAMS, M. D., Lieut. Commander, USN (7-22-55 to

U. S. NAVAL RADIO STATION, POINT LOMA
San Diego, California

RADIOMEN IN CHARGE - OFFICERS IN CHARGE

1. 1906- MOORE, R. W., Electrician 2nd Class, USN
2. 1906- MILLISON, A. J., Electrician 1st Class, USN
3. 1908- RICE, A. R., Chief Electrician, USN
4. ANDERSON, R., Chief Electrician, USN
5. KIEFER, H. V., Chief Electrician, USN
6. 1914-1917 TWISS, G. O., Chief Electrician, USN
7. 1917- FANNING, W. N., Chief Electrician, USN (to Chollas Heights as Gunner)
8. 1917- CHADICK, J. F., Chief Electrician, USN
9. 1917- STONE, Ellery W., Lieutenant USN, RF -Officer in Charge, also Asst.DCO
10. RYBERG, S. W., Chief Electrician, USN
11. MANNING, H. D., Chief Electrician, USN
12. NICKLES, F. E., Chief Electrician, USN
13. -1929 ARMSTRONG, G.C., Chief Electrician-Radioman, FNR
14. 1929-1931 APPLE, W. E., Chief Radioman, USN
15. 1931-1932 CLARK, H. R., Chief Radioman, USN
16. 1932-1934 WEAVER, I. A., Chief Radioman, USN
17. 1934-1937 HUMPHREYS, H. C., Chief Radioman, USN
18. 1937-1940 BOWEN, M. A., Chief Radioman, USN
19. 1940-1942 WALKER, L. W., Chief Radioman, USFR
20. 1941-1943 PRATHER, A. W., Lieutenant (JG), USNR
21. -1946 ISBELL, J. D., Lieutenant Commander, USN
22. 1946-1948 HALPIN, J. B., Lieutenant Commander, USN
23. 1948-1949 CLARK, A. E., Radio Electrician, USN

Message traffic totals - Navy Radio Station, Point Loma.

1906	3,000	messages	1931	7,818,262	words	
1924	4,569,401	words	1932	8,149,536	"	
1925	4,802,772	"	1933	7,970,370	"	
1926	5,624,109	"	1934	9,990,887	"	
1927	8,985,223	"	1935	8,533,352	"	
1928	9,200,892	"	1936	8,875,225	"	
1929	8,573,670	"	1937	9,262,783	"	
1930	7,583,910	"	1967	1,000,000	<u>messages</u>	NAVCOMSTA SAN DIEGO
			1981	2,000,000	<u>messages</u>	NAVCOMSTA SAN DIEGO

Totals from 1924 to 1937 were furnished by the Pacific Communication Officer.
Totals for 1967 and 1981 are from the Naval Communication Station, San Diego files.

PERSONNEL COMPLEMENTS

POINT LOMA:

	1926	1927	1934	1936	1937
CRM	4	4	5	5	5
RM1c	8	7	8	8	8
RM2c	10	9	13	6	6
Y3c	$\frac{12}{34}$	$\frac{10}{30}$	$\frac{0}{26}$	$\frac{7}{26}$	$\frac{7}{26}$

Plus various other non-radio ratings and variable number of marines. Reduction in personnel allowances after 1926 probably a result of transfer of NSS circuit to NFG.

CHOLLAS HEIGHTS

	1929	1934	1939	1940
Warrant Officers	1	1	1	1
CRM	1	2	3	3
RM1c	0	4	3	7
RM2c	4	4	4	0
RM3c	$\frac{4}{10}$	$\frac{0}{11}$	$\frac{0}{11}$	$\frac{0}{11}$

Plus various other non-radio ratings.
From about 1930 until 1936, Radiomen Third Class were not eligible for shore duty.

Names and titles often tell a story of their own. Below are listed the officers who inspected the radio stations at Point Loma and Chollas Heights during the 20s,30s,40s.

	B4	25	26	27	28	29	30	31	32	33	34	35	36
SWEET, Geo. C. LCDR, BUENG	x												
MCCONNELL, R.S. LCDR, RMO Mare Island	x												
COMAN, R.G. LCDR, RMO Mare Island	x												
STONE, E.W. LT, Asst DCO 11ND	x												
PITTS, H.L. LT, Asst DCO 11ND	x												
MCCORMACK, H.W. CDR, RMO Mare Island	x												
HOOVER, S.C. CDR, Flt. Rdo. Officer	x												
HOOVER, S.C. CAPT. BUENG			x										
ASHLEY, J.M. LCDR, DCO 11ND	x												
LECLAIR, H.P. LCDR, Flt.Rdo.Officer	x												
BERRY, H.B. LCDR, DCO 11ND		x	x										
ROBERTSON, A.H. RADM, COM11		x						x					
MCKEAN, J.S. RADM, COM11			x	x									
OBERLIN, E.G., CDR, NRL			x										
THOMAS, A.C. LCDR, DCO 11ND				x									
LUND, P.M. LT, Asst. DCO 11ND				x									
DAVIS, M.S. CAPT, PCO				x	x								
WOODWORTH, E.B. CDR, DCO 11ND					x	x	x						
DODGE, F.R. LT, Asst DCO 11ND					x	x							
CULP, R.S. CAPT, PCO						x	x						
ALLEN, J.L. LT, Asst DCO 11ND							x	x					
GRAY, L.R. LCDR, DCO 11ND								x	x				
SENN, T.J. RADM, COM11								x	x				
FREDERICK, E. CAPT, Asst COM11								x					
ELLIOTT, M.S. CAPT. Dist.Med. Off.								x					
WEBB, D.C. CAPT. PWO								x	x				
PATTEN, S.F. LT, Asst DCO 11ND									x	x			
CHURCH, J.G. CAPT, Asst COM11									x		x		
FARENHOLT, A. RADM, Dist.Med.Off.									x				
INGLIS, T.B. LCDR, DCO 11ND										x	x		
TARRANT, W.T. RADM, COM11										x	x		
MAYFIELD, I.H. CDR, PCO (CAPT in 35)										x		x	
WRIGHT, A.M. LT, Asst DCO 11ND											x		
KINNEY, P.R. LT, Asst DCO 11ND											x		
EDGAR, C.D. LCDR, DCO 11ND											x	x	x

	37	38	39	40	41	42	43	44	45	46	47	48	49
EDGAR, C.D. CDR, DCO 11ND	x												
GANNON, Sinclair, VADM, COM11	x	x	x										
TERHUNE, J.A. CDR, DCO 11ND	x	x	x	x									
RUBLE, W.J. CDR, PCO		x											
MCGIRR, W.P. LT, Asst DCO 11ND			x										
BLAKELEY, J.R. RADM, COM11					x								
GRIMES, W. F. CDR, DCO 11ND					x	x	x						
ALLEN, J.L. CDR, DCO 11ND				x									
ELEY, F.L. CDR, DCO 11ND							x						
LAWVER, R.C. CDR, DCO 11ND								x	x				
ARPS, A.W. CDR, Asst. DCO								x					
FORSTER Kenneth, CAPT, WSF COMM OFF													x
MURPHY, J.W. CAPT, DCO 11ND													x
RAY, C.C. CAPT, DCO 11ND													x

Early U. S. Navy shore wireless stations.

1902-

1904

Location

Call sign

Transmitter

Cape Elizabeth, Maine
Navy Yard, Portsmouth, N.H.
Cape Ann (Thatcher's Island)
Navy Yard, Boston, Mass.
Highland Light, Cape Cod, Mass.
Nantucket Shoal Lightship
Torpedo Station, Newport, R.I.
Montauk Point, Long Island
Navy Yard, New York
Highlands of Navesink, N.J.
Cape Henry, Virginia
Navy Yard, Norfolk, Va.
Naval Station, Key West, Florida
Dry Tortugas, Fla.
Navy Yard, Pensacola, Fla.
San Juan, Puerto Rico
Culebra, West Indies
Naval Station, Guantanamo, Cuba
Canal Zone
Yerba Buena Island (Goat Island,) Calif.
Navy Yard, Mare Island, Calif.
Farallon Island, Calif.
Naval Station, Cavite, Philippine Islands
Cabra Island, P.I.
F. ululu, T. H.

PA

PC

PE

PG

PH

PI

PK

FR

PT

PV

QN

QL

RD

RF

RK

SA

SD

SI

SL

TI

TG

TH

UT

UY

Slaby-Arco?

2 KW Stone

Slaby-Arco?

2 KW Stone

Slaby-Arco?

Slaby-Arco?

Slaby-Arco?

Slaby-Arco?

Slaby-Arco?

Slaby-Arco?

Slaby-Arco?

Slaby-Arco?

35 KW De Forest

Slaby-Arco?

10 KW De Forest

35 KW De Forest

Slaby-Arco?

35 KW De Forest

35 KW De Forest

Slaby-Arco?

Slaby-Arco?

5 KW Massie

Slaby-Arco?

Slaby-Arco?

Slaby-Arco?

1904-

1906

Point Loma, Calif.
Beaufort, N.C.
Charleston, S.C.
Table Bluff, Oregon
St. Augustine, Fla.
Jupiter Inlet, Fla.
Navy Yard, Puget Sound, Wash.
Point Arguello, Calif.
Washington, D.C.
Tatoosh Island, Wash.
Cape Henlopen, Delaware
Cape Blanco, Oregon
North Head, Wash.
Naval Academy, Annapolis, Md.
New Orleans, Louisiana

TM (Also TL) 5 KW Massie

5 KW Massie

5 KW Massie

5 KW Massie

5 KW Shoemaker

5 KW Shoemaker

3 KW Massie

TK

3 KW Massie

RN

15 KW Massie

TD

15 KW Massie

3 KW Massie

TA

10 KW Massie

TE

10 KW Massie

5 KW Stone

6 KW Telefunken

1912

Kodiak, Alaska
Dutch Harbor, Alaska
S' Paul, Alaska
Unaiga, Alaska
St. George, Alaska
Cardova, Alaska

(between 165 and 300 Kc)
Telefunken quenched-gap
Telefunken quenched-gap
Telefunken quenched-gap
Telefunken quenched-gap
Telefunken quenched-gap
Telefunken quenched-gap

UNITED STATES PACIFIC FLEET
U. S. S. PENNSYLVANIA, FLAGSHIP

crf

Cincpac File No.
A6-1/(20)
Serial

2973

Pearl Harbor, T. H.

DEC 27, 1941

From: Commander-in-Chief, United States Pacific Fleet.
To: Commandant Eleventh Naval District.
Subject: Communications.

1. During the enemy raid on Pearl Harbor December 7, 1941, there were many casualties to communication control lines from the Navy Yard to the receiving and transmitting stations. The high power transmitting station was under attack and for a time doubt was created as to its ability to keep on the air.

2. Because of the above conditions the Commander-in-Chief directed the simultaneous keying of NPM and NPL by himself to insure Fleet communications during actual combat purposes. Material conditions prohibited the use of previously determined casualty frequencies. The speed with which Radio Station NPL complied with the request and the intelligent service rendered was a source of gratification to the Commander-in-Chief.

W. S. Pye /s/

W. S. PYE.

THE FOLLOWING NOTE HAS BEEN RECEIVED FROM THE COMMUNICATION
OFFICER ON THE STAFF OF THE COMMANDER-IN-CHIEF, U.S. FLEET:

I shall never be able to tell you how much I appreciated the cooperation you gave during the raid. We could not use the regular casualty procedures and the intelligent manner in which you and your gang backed us up is something I shall never forget.

Resp. (No fooling),

CURTS.

PLEASE KINDLY ADDRESS
"COMMANDANT"
THE SIGNER BY NAME
R T J.

COMMANDANT'S OFFICE
ELEVENTH NAVAL DISTRICT
SAN DIEGO, CALIFORNIA

PUBLISHED

11/A6(H1)
rial C501

January 9, 1942

From: The Commanding Officer.
To: ✓ The Officer in Charge, Receiving and
Control Station, Point Loma.
The Officer in Charge, Transmitting
Station, Chollas Heights.

Subject: Communications.

Reference: (a) Cincpac file A6-1/20, Serial 2973
dated December 27, 1941.

Enclosure: (A) Copy of Reference (a).

1. This letter and Enclosure (A) will be
published at quarters.

2. The Communication organization of the
Eleventh Naval District has rendered a valuable service
to the Fleet under unexpected conditions. Due to the
excellent manner in which each man has perfected himself
in his assignment, it has been possible for us to render
this service.

3. Suitable notation will be made on the
next fitness report of Lieut.(j.g.) A. W. Prather C-V(S),
U.S.N.R., Officer in Charge, Receiving and Control
Station, Point Loma, and Ensign M. W. Palmer, U.S.N.R.,
Officer in Charge, Transmitting Station, Chollas Heights.

4. The Officer in Charge at Point Loma and
at Chollas Heights will inform the Commanding Officer of
the names of the enlisted men of the command who demon-
strated outstanding ability during the period 0800 zone
plus 8, December 7, 1941 to 2400, December 10, 1941 while
the radio circuits of this district were under direct
control of the Commander in Charge, Pacific Fleet.
Suitable entry will be made in the service records of
these men.

W F Grimes

W. F. GRIMES

Radio Point Loma - Navy Electronics Laboratory
Decommissioning Ceremonies - Ground Breaking
San Diego, 24 June 1949

Captain Ray (Introduction of Mr. R. B. Stuart):

Admiral Baker, Captain Bennett, ladies and gentlemen: We are privileged to participate today, here in a transmigration ceremony. The passing to the stalwart Navy Electronics Laboratory of the spirit of research and development in the electronics art which has burned so brilliantly in the life of Radio Point Loma during the half century of its existence. Radio Point Loma's flag which has flown proudly since May 12, 1906, has just been lowered for the last time by Bob Stewart who made the original wireless installation in 1906 and Allen Clark, the last active officer in charge of the station, and was delivered by them into the hands of your San Diego neighbor, Wayne Prather, officer in charge of Radio Point Loma on the fateful morning of December 7, 1941, when Point Loma played so dramatic and vital part in keeping alive the wounded body of the Pacific Fleet.

We shall shortly break good Point Loma ground to signify the beginning of construction of a magnificent new building to meet the growing needs of the Navy Electronics Laboratory, into which the spirit of Radio Point Loma passes today. Undoubtedly, that giant offspring of Radio Point Loma will experience birth pangs and growing pains akin to those experienced by its forebear in the beginning years of the century. In order, therefore, that those who are charged with the nurturing of the body of the son may gain wisdom from a portrayal of youthful difficulties overcome by the sire, the person best qualified to tell that story will recount a bit of it in the closing moments of the history of Radio Point Loma. It is my pleasure to present Mr. R. B. Stuart, engineer in charge of the initial installation at Radio Point Loma.

Mr. R. B. Stuart:

Admiral Baker, Captain Bennett, Captain Ray: It is kind of like old home-coming week for me to come back to Point Loma. I see so many familiar faces, and all of the scenes here are something that I have had an intimate part in developing. The building of these grounds was started by Commander Woodworth and his assistant at that time was Captain Jerry Allen who is here today. At the original commissioning of this station 43 years ago, we didn't have such an august body present. In fact, we had no officers at all. I was a Chief Petty Officer and, with the assistance of two enlisted men we commissioned the station. As I look back over the history, there were two precedents established: enlisted men commissioned the station and the officer in charge quarters that were built for the DCO were never occupied by him and were continuously occupied by an enlisted man until World War II. The quarters you see over there, Admiral T. J. Senn thinks should have belonged to the Commandant of the District, and I hope Admiral Baker will go through those quarters some time and maybe he would like to move out to Point Loma.

At the time we commissioned this station, Point Loma was on the far reaches of San Diego. We came out in a horse and wagon. We loaded our radio gear at the Santa Fe wharf and it took nine hours to get out to Point Loma. After we got here we were so tired we didn't care if we never saw San Diego again. But we stayed here and we finished the job. The actual commissioning of the station took place at nine O'clock at night.

When the station was built, it was the intention that it would communicate between Point Loma and Point Arguello. That would be the relay point from there to the Farralones and into the maintenance yard at Mare Island. We put power on the apparatus at nine o'clock. I called up Mare Island on a hunch that maybe we might get a connection with them. They answered immediately. This was the first time in the history of the Navy that wireless contact had been made over land for that distance. The previous distance had been 110 miles.

In those days we took telegraph operators and made electricians out of them, or we took electricians and made telegraph operators out of them. When they came to a shore station they found that there was something else to do besides be an operator. They had to learn how to operate a gas engine and repair it. They had to dig ditches, take care of sewers, and if they wanted to eat they had to cook. The first operator in charge of this station, Andy Millison, started his Navy career as a coal passer.

When the Navy Yard workmen left the station - in fact, left any station, up until 1910 - the operators were on their own. They had to be resourceful. They had no technicians to fall back on. And they got in a lot of trouble if they ever went off the air. Consequently every wireless operator carried his own gear with him. He had an idea he could build a better receiver than anybody could build for him, and he carried the parts in his ditty box.

At that time they were not bothered with any communication procedures. They didn't have any regulations. The operator on watch made his own rules. He set the speed. If the operator at the other end couldn't copy him he turned him in. The Point Loma station, with only 12 vessels in the Pacific Ocean equipped with wireless, handled something over 50,000 words the first year it was in operation. That seems an infinitesimal number of words to be handled when we look at present day communications when a normal four hour watch will handle that many words.

The first scientific research that was ever conducted in this area was conducted by Dr. Louis W. Austin, the first head of the Radio Telegraph Laboratory in the Navy establishment. He was named its head from 1908 until 1924 and came to San Diego. At Point Loma and also the Naval Air Station, he conducted his research into the causes of interference, on which he wrote quite a number of treatises.

I think the high point in the history of Point Loma occurred on the 7th of December, 1941, when Commander Prather was officer in charge of this station. A request was received from the Commander in Chief for a direct circuit to Washington. The equipment was here. Commander Prather gave him that circuit and they operated solid for the length of time the Commander in Chief required that circuit.

Throughout the years it has been my privilege to be actively connected with communications from the days of the old coherer to the present time and I am very happy to be given the privilege of attending this decommissioning of the Point Loma station. Thank you.

Captain Ray (address and introduction of Rear Admiral W. D. Baker, Commandant, Eleventh Naval District):

Thank you Mr. Stuart.

You, in particular, and to a lesser degree all of us who have been intimately associated with Radio Point Loma must derive considerable satisfaction from the fact that though its official life as a radio station terminates today, its memory

is perpetuated by the call sign NFL - NAVY POINT LOMA - which comprises all radio stations of the Navy in the San Diego area - now and foreseen.

Before reading the order which officially terminates the life of Radio Point Loma, I'll read you two messages, each from an officer well qualified to write the station's epitaph. The first is from Rear Admiral Morris E. Curts, commanding the Operational Development Force, U. S. Atlantic Fleet at present, and on December 7, 1941, the Communications Officer of the Pacific Fleet:

"On the occasion of the transfer of Radio Point Loma from an operational station serving the fleet to an experimental station for the Navy Electronics Laboratory, the years of excellent service that station has given the Pacific Fleet are recalled with admiration. The superlative performance of Point Loma during and immediately following the Pearl Harbor attack, when it served the entire Pacific Fleet by radio link from the Headquarters of the Commander in Chief, Pacific Fleet, indicated the degree of ever-readiness of that station to serve and to serve well. I have every confidence that in its new assignment Radio Point Loma will continue to be a valuable adjunct to the Navy and to the Nation."

(signed) M. E. Curts

The second is from Rear Admiral Earl Stone, present Chief of Naval Communications:

"With the disestablishment of the pioneer Navy Radio Station at Point Loma, it is fitting to note the great progress in Navy communications material which has been reflected in the changing radio installation at Point Loma. Point Loma was established on 12 May 1906 during the arc-spark era of wireless telegraphy and the station has served continuously through the years with a high order of effectiveness. Although circumstances now make it impracticable to carry on Navy radio activities on the Point Loma site, the former officer, enlisted and civilian personnel attached to the Point Loma Navy Radio Station may well take great pride in the splendid record that they helped to make by consistently maintaining high standards of service."

I have here the letter that disestablishes Radio Point Loma and turns portions of it over to the Navy Electronics Laboratory:

From: Commandant, Eleventh Naval District.
To: Director, Navy Electronics Laboratory, Point Loma.
Subject: Transfer of buildings and grounds of the inactivated Navy Radio Station, Point Loma, to the custody of the Director, Navy Electronics Laboratory.

1. On 12 September 1945, the Director, Navy Electronics Laboratory (my friend Admiral Hord, Retired), recommended to the Bureau of Yards and Docks that the site and buildings of U. S. Navy Radio Station, Point Loma, be assigned to the Radio and Sound Laboratory, San Diego, now the Navy Electronics Laboratory.

2. On 12 August 1946, the Commandant, by direction of the Secretary of the Navy, transferred buildings and grounds of the Radio Station, Point Loma, to the Director, Navy Electronics Laboratory, with the exception of the married enlisted men's quarters, the two storerooms in the west end of building 18, the south side of building 18, quarters A, buildings 11, 17 and 20 and the surrounding grounds to those areas. On 11 April 1949, the Chief of Naval Operations approved final transfer of all remaining buildings and grounds to the Director, Navy Electronics Laboratory.

3. The Director, Navy Electronics Laboratory, is hereby assigned custody of the balance of the facilities at the Radio Station, Point Loma.

The horizons of those of us, such as Captain Bennett and I, who are in the lower echelons of authority and responsibility in the naval establishment, must necessarily be limited largely to the boundaries established by the many written departmental directives which serve as our guide, and by the limitations imposed by our relative inexperience in the interpretation of those guides. Our realization of the significance of today's ceremony and our ability to interpret it may likewise be limited. We are fortunate, however, in having as the principal participant in today's ceremony our mutual commanding officer, who by virtue of his longer and more varied naval experience and his direct responsibility to the chief naval authority, is in a position far better than the rest of us to evaluate the significance of this ceremony. It is my privilege to present Rear Admiral Wilder D. Baker, Commandant, Eleventh Naval District, and the direct representative of the Chief, Naval Operations:

Admiral Baker:

Captain Bennett, Captain Ray, Mayor Knox, Mr. Stuart, other distinguished guests and friends of Radio Point Loma and the Navy Electronics Laboratory:

As Captain Ray said, my experience goes back somewhat longer than his, but not as long as that of Mr. Stuart. I can remember when I was a midshipman, then Lieutenant Stanford Hooper, who later became Director of Communications in the Navy, who was also one of the greatest, I guess, communication officers, not radio officers as the technical part, but the man who got the word through from here to there - - probably one of the greatest and the first most important communication officers in the Navy. He was my instructor at the Naval Academy and told us then - this must have been about 1912 - of his first experience at direction finding. He was on the Admiral's staff in the Atlantic Fleet and they were on the scouting line. One of the destroyers - we didn't have any cruisers then - one of the destroyers, a torpedo boat, sent a flashing light signal over and said: "radio signals of the enemy are getting weaker." So he immediately turned to the Admiral and said: "We are going in the wrong direction" and they turned around and later found the enemy, or own forces. But it shows how great an advance has been made in radio techniques since those days. Another experience that I was privileged to have was when Captain Winterholden was Commander in Chief of the Atlantic Fleet. He issued the famous order: "There will be no more static." By golly, that had an effect, too! You'd be surprised how much influence the Commander in Chief had on radio.

I'm afraid that some of this that has been prepared for me to give has already been said, but maybe that is a communication strongpoint - that we keep pounding at it until we are sure it's across, like just one more from the photographer here.

The significance of this ceremony is really quite far reaching. The establishment of Radio Point Loma at the beginning of the century marked the Navy's realization of the arrival of the age of wireless. The hitherto most rapid means of communication was that of a fast vessel, usually a destroyer coming from ports out to sea. We realize it is not fast enough. Today the relinquishment of Point Loma to allow the Navy Electronic Laboratory to come of age, is tangible evidence of the Navy's realization that in this atomic-electronic age, this nation's first line of defense is as truly in the scientific laboratory as in the most far flung force at sea. In disestablishment of Radio Point Loma the Navy is not merely removing to another location a considerable number of radio equipments, but is putting an end to the operation of an activity which was not only a constant pioneer in the field of radio communications, but which served dramatically in events of lasting historical importance. Establishment of a wireless station at Point Loma resulted from the realization that with the United States having become a Pacific power as a result of the Spanish-American War, there must be wireless

communication with the fleet which must operate in the Pacific. Also, Point Loma was the nearest suitable location for a wireless station to communicate with ships which would someday come northward from or go southward toward an Isthmian canal.

An item of importance in Point Loma's contribution to the art of radio communication was a successful test of ship-shore voice radio communication, using the newly developed DeForest vacuum tube between Point Loma and Doctor DeForest himself who was on board the USS CONNECTICUT off San Diego in the 1908 voyage of the fleet around the world.

I would like to interject here that the father of my aide, Lieutenant Reese, who stands over here and for whom there wasn't a seat, was also a radioman in the White Fleet off Point Loma on that day when DeForest talked from the ship to the shore. I think that is an interesting comment. This young man's father was then a young man and he was only an idea.

In 1912 the present system of three letter call signs for wireless broadcasting stations was established - all Navy stations having "N" as the first letter. About the same time pioneer investigations on atmospheric interference in wireless communications were conducted at Point Loma by Dr. Loy W. Austin, head of the Navy Electro-Telegraphic Laboratory at the Bureau of Standards. Point Loma served as a means of communication with U. S. nationals in Central America during the era of dollar diplomacy, utilizing USS CALIFORNIA, an armored cruiser stationed at Guaymas, in the Gulf of California, as a wireless link. Point Loma communicated with radiomen employed by United States interests at mines and sugar companies throughout Central America.

Lieutenant Commander Glem Twiss, officer in charge of Point Loma from 1914 to the beginning of World War I, contributes a story of local interest: When the efforts of Hatfield, the rainmaker, who was offered \$ 10,000 to relieve a serious drouth, were so successful that the resulting flood burst Otay Dam, completely isolating the city and washing out all railroad tracks and telegraph lines. Radio Point Loma served as the only medium for representatives of the press to get news into and out of San Diego. Although that was before the days of public information officers, Commander Twiss insisted that every news story transmitted by his station carry the by-line "via Radio Point Loma."

In the 1920's Point Loma became the first station on the west coast to handle transcontinental traffic. Admiral S. C. Hooper, then Director of Naval Communications and a pioneer in the development of the art, besides being a ham radioman, came to San Diego and himself tapped out the first transcontinental message from Point Loma.

In 1940, during the tenure as District Communication Officer of Captain, then Commander Jerry Allen, who sits up here, who is with us today, radio-relay equipment was established at Point Loma which enabled signals received at Point Loma to key Chollas Heights transmitters automatically thus relaying incoming signals by that station's high powered transmitters.

On the Sunday morning of December 7, 1941, Commander, then Lieutenant Junior Grade Wayne Prather, Officer in Charge of Point Loma, had noted that his station was performing with its usual efficiency and relaying the Pacific Fleet broadcasts through the high powered station at Chollas Heights during a routine maintenance period of the high powered transmitters at Oahu. The signals were actually being received from low-power high frequency transmitters in Oahu via Navy Radio San Francisco. Lieutenant Prather was peacefully going about his gardening when the siren on the Operations Building brought him on the run. His watchful relay supervisor

had just spotted in his monitor copy of the Pacific Fleet broadcast Captain Curts' cryptic, now famous, message: "Japanese attacking Pearl Harbor. This is not, repeat, not a drill." Thus Radio Point Loma controlling Chollas Heights transmitters broadcast the first news of the Japanese attack.

On monitoring the Point Loma control broadcast at Pearl Harbor, the Pacific Fleet Communication Officer, Captain Curts, knew that Point Loma was on the job. Point Loma stayed on the job and some hours later when the Oahu high-powered transmitters were back on the air, picked up signals direct and continued to relay them through Chollas Heights as an emergency backup for Radio Pearl Harbor. Lieutenant Prather then had his full company remain on the job for 60 hours without rest. His reward was an official commendation from the Commander in Chief of the Pacific Fleet and a warm personal letter from Captain Curts ending with his highest respects, to which he added, "I mean respect, no fooling!"

The first of June 1940, the Navy Radio and Sound Laboratory, San Diego, was established on Point Loma by the Secretary of the Navy. The first building was occupied on 21 August 1940, with Commander Jennings B. Dow, U. S. Navy, as Officer in Charge. The past experience of Radio Point Loma, the unobstructed site presented for the study of electromagnetic wave phenomena, and the ready access of coastal and deep sea areas for the study of underwater problems, together with the fact that the climate permits outdoor testing and investigation ashore and afloat throughout the year, dictated its establishment on Point Loma. It is interesting to note that, although much progress has been made, several of the first problems assigned, such as the study of radio wave propagation, and shipboard antenna characteristics, remain very active today, nine years later. I don't want you to think we haven't made some progress, however. June the 6th, 1941, the Bureau of Ships directed the Laboratory to provide space and facilities for the University of California, Division of War Research, a facility of the National Defense Research Council. During the war years, the two groups, Navy and civilian, worked both together and separately a multitude of problems with highly significant results in the prosecution of the war.

Early in 1945, the Bureau of Ships began post war planning for the Laboratory and in November 1945 the name was changed to the U. S. Navy Electronics Laboratory.

In January 1946, the Laboratory began taking over the work which had been assigned to the University and by June of that year had assumed responsibility for all of that work. In the post war years there has been a marked increase in the scope and importance of the Laboratory's mission and a commensurate increase in personnel and plant facilities. When commissioned in 1940, the Laboratory complement was one officer and three civilian employees. At the present time the complement is eleven officers, fortysix enlisted ratings, and 1,110 civilian employees.

The problems successfully solved by the Laboratory in these formative years have been innumerable and of great significance. Although many of the problems completed successfully remain in a classified status because of their import to national security, numerous ones, such as the successful development of the Model Range, which provides a rapid, reliable and inexpensive means of determination of best shipboard antenna arrangements, the development of the SOFAR Project by means of which the locations of aircraft ditched at sea may be quickly and accurately determined, and the studies in super frequency radio wave propagation, have an important bearing on the establishment of television link stations, are notable.

Note::: New address 2166 Edinburg Ave.
Cardiff, Calif.,
August 5, 1962

Mr. Jerry Mac Mullen,
San Diego, Calif.,

Dear Friend:-

Your letter and copy of the Star of India book received the other day but due to change of address, it has been very poor time to answer, even your very nice letter and the receipt of your book. I do thank you very much for your letter and the desire to enter parts of a letter of mine in the Society Quarterly, and I most certainly am very happy to receive the very historic book. It shall go with many of my other historical books and it will be always consulted as necessary. I thank you ever so much for sending it, particularly as you have chosen a person who will consider its value very much.

Now about our old Iris.

The receiving equipment consisted of The send- receive switch which was a Shoemaker. Its functions consisted of a double pole switch with Sending in up position, receiving in down position, no it was the reverse, for in sending, the antenna leads were at the top of the instrument and in sending, naturally the receiving was cut off. The circuit which normally would have cut off the primary input current was used to start the mercury interrupter and also place the transmitting key into sending position. A small side circuit, with the receiving circuit in order was at a position slightly above the transmitting key position so that you could listen just before the transmitting started. This was a tricky thing and if adjusted too closely, you could get an awful kickback thru the phones and probably damage the phones.

The phones were 2,000 ohm Kellogg; the detector was a Shoemaker platinum cup with a wad of cotton in 5% sulphuric acid keeping the cotton damp. Above this cup was a small pin vise affair which held a Wollaston wire 4/1000 diameter. The wire was silver plated in order that we could see and handle it. The acid burned the silver off and the platinum wire then was in working order and this whole arrangement was in series with the condenser and in circuit with the tuner, which was also Shoemaker, consisting of a two coil, copper wire with silk insulation circuit wound on two spools, the side of each wound spooled wire was scraped and slides gave contact to the circuit, just exactly as the hams used to use. These spools were twelve inches long and 3" diameter; one coil in the antenna circuit for loading as a loading coil, the other spool had two sliders, which gave the secondary tuning. In series with the detector and ground was a small condenser (fixed) as we never heard of a variable condenser in those days.

We oftentimes used carborundum and other things such as galena, sirocite and even a needle suspended across two sharply edged pieces of carbon, which we used after it had seen service in our searchlight. The negative pole searchlight carbon was the best.

The mercury interrupter was a mess, Its use was to make a pulsating current from our 60 volt ship's current (DC of course) The description: A small fan type fan motor, with a pump attached to the suspended shaft. This pump was (the pump intake) suspended in a cast iron pot, hanging from the motor assembly. The mercury pot held ten pounds of chamois filtered mercury. The output of the mercury went thru a revolving nozzle and the mercury was thrown in

2166 Edinburg St
Cardiff, Calif. Tel. 753-4091

2 Stevens

a stream at an insulated segment. This brass segment carried the interrupted DC to the primary of the transformer (12" spark coil) thru the key and back to the source. If the motor rotated at 3,000 RPM, the frequency would be very low, so we used two or more segments, in order to increase the frequency, which certainly improved the received messages, just the same as the frequency of present day receivers is better than the old 60 cycle days.

This completes the power supply, for we had no AC and no real transformers. The transmitting circuits follow:- The transformer was a 12" spark coil with vibrator at the end of the coil. We dismantled this vibrator and connected the circuit of the primary to the Pulsating DC supply. This of course gave us a lopsided half wave, or rather a strong one side and a weak other side to this wave. This was a typical Tel. outfit and the oscillation transformer which we used consisted of a large rubber constructed affair with the spark coil in the middle. This spark coil was made of zinc with silver contacts and the length of spark was normally about one half inch. The outer surface of this rubber affair was found with one long silver coated copper wire, upon which were several slides, which slid around the coil as best adapted. The primary of the secondary circuit was the current ~~which~~ came from the transformer secondary (spark coil) and went thru the twelve Leyden Jars and so on in the primary or tuning circuit. The aerial circuit used this same set of wires and clips and the aerial circuit was tuned by these slides to suit the frequency. We had no tuning instructions and we tuned the set by placing a 12volt lamp in circuit near the antenna circuit and we tuned by gosh and by god means, to get the best light on this insulated lamp circuit. We also used a three point anchor gap.

Now here is the antenna. We had four wires suspended from glass knobs on our two antennae between masts. We had the leading ends forward with two leads. Two antenna wires went to one lead and the same applied to the other two. At the far end (aft) we joined all four wires together. This was a loop antenna. Thru the rubber tube we brought two insulated brass rods each rod conducting one half the leads, that is two wires in the circuit to each rod. These went to either side of our anchor gap. In receiving, one side of this circuit went to the loading coil of the receiver and the other side went to the tuning coil. The coils were of course grounded. If we got a spark, in transmitting at the anchor gap, we were indeed very happy, for we hoped to get at least 100 miles if we were lucky. I, had good luck and almost every day or rather night, managed to get Point Loma from Magdalena but the operator at Point Loma wasn't happy at any time when he had to get my messages, for they generally called for much repeating, generally of this order "Repeat all before 'and'" and later on he would say "Repeat all after 'and'".

British The Iris was the navy name and I can not recall the British name. The Arethusa and the Iris were both British and one of the two was named Menemsha. If you have a 1928 or before Register of Merchant ships, look in the back end of the book for navy ships and get the proper name there or else look for Iris in the general place under steam vessels.

Your newspaper stories are fine, and I sure like them. Some day I'd like to call and take a look at you. I never have been to your office but I's sure like to have a minute or two with you and I think that I'll be might glad to see you. Hope that I may impress you too.

Sincerely yours

Edward D. Stevens

The information contained in these insert pages consists of excerpts from the July 15, 1919, annual report of the Pacific Coast Communication Superintendent. On July 1, 1919, the San Diego Communication District was consolidated with the San Francisco District with all stations coming under the District Communication Superintendent at San Francisco, who is represented by an assistant stationed at the Point Loma Radio station. The new Eleventh Naval District was established on January 28, 1921. At that time all of the stations listed here came under the District Communication Officer of the Eleventh Naval District, LCDR J. M. Ashley, USN. A copy of the 1919 annual report was not located and obtained until after the initial compilation of the 11th Naval District radio communication history had been completed in 1984.

* * * * *

Naval Communication Service
Pacific Coast Division
San Francisco District (only San Diego District stations listed.)

U. S. Naval Radio Station, San Diego (NPL):

Receiving and control station located at Point Loma, California. Four (4) receiving antennae operated in conjunction with three (3) receiving sets are installed. Range of damped wave receiving set is from 200 to 30,000 meters. Range of undamped receiving set from 3800 to 30,000 meters.

Transmitting station located at Chollas Heights, California, consisting of one (1) 200-KW arc set, adjusted for the following wave lengths: 4000 meters (primary calling), 5300 meters (primary working), 9800 meters (primary working), 13,300 meters (super-primary working) and 15,200 meters (super-primary working); and one (1) 5-KW 500 cycle quenched spark set, adjusted for the following wave lengths: 600 meters (commercial and distress), 952 meters (secondary calling), and 2400 meters (secondary working). The 200-KW arc is used when the 30-KW arc does not furnish reliable communication. Generally, speaking, the 30-KW arc is used in communicating with San Francisco and Inglewood, and the 200-KW arc when working with Pearl Harbor, Balboa and ships in Mexican waters. Under favorable conditions, the 30-KW arc has been used for communication with all the points noted above. All of these transmitters are operated by distant control from the Point Loma station. Receiving apparatus is also installed at the Chollas Heights station for use in the event of the Point Loma station or the control lines being rendered inoperative.

The distant control lines consist of three (3) private telegraph circuits between the Point Loma and Chollas Heights stations leased from the Pacific Telephone and Telegraph Company. It may be necessary in the future to lease an additional distant control line for the operation of an additional small spark set at the Chollas Heights station for communication with vessels in the harbor and Naval seaplanes.

Radio Communication: Arc set: Now in effect with San Francisco, Pearl Harbor, Balboa, Inglewood, and with Naval vessels equipped with arc apparatus, dependent on their range. Can be effected with San Francisco (Beach), Great Lakes, Belmar, N.J., Tuckerton, N.J., Annapolis and other medium or high power arc stations. Signals are received from Cavite, Funibashi, Japan; Nauen, Germany; and Lyons, France. Spark set: Now in effect with Point Arguello, East San Pedro, Avalon, and with ships equipped with spark sets, dependent on their range. Can be effected with San Francisco, if required by emergency.

The 30-KW arc set is available for effective communication with San Francisco, Inglewood, South San Francisco, and with ships equipped with arc apparatus, dependent on their range. Under favorable conditions, it could also be used to communicate with Heeia Point, Pearl Harbor, New Orleans, Great Lakes, and Washington, D.C.

The San Diego station broadcasts local weather conditions at 8:00 a.m., noon,
-10a- (temporary insert page - January 1985)

4:00 p.m., and 8:00 p.m.: Daily weather report and a POM report is sent to San Francisco at 8:00 a.m. Hydrographic information and weather bulletins at 10:00 p.m. ALNAVS and other general despatches are broadcasted on 9800 meters (arc) and on 2400 meters (spark), at noon and 10:00 p.m. The following additional schedules are in effect: 1:00 a.m. Balboa; 3:00 a.m. U. S. Naval vessels in Mexican waters; 4:00 a.m. British Naval vessels in Pacific waters; 11:00 a.m. time signals, except Sundays and holidays, on 9800 meters (arc) and 2400 meters (spark); 1:00 p.m. Balboa; 8:00 p.m. Balboa; 9:00 p.m. British Naval vessels in Pacific waters; 10:00 p.m. U. S. Naval vessels in Mexican waters. San Diego calls Pearl Harbor on the even hour, and listens for calls from Pearl Harbor on the half hour. All times noted above are standard (sun) 120th meridian time.

Telegraph connections: Point Loma has connections to the San Diego offices of both Western Union and Postal. Chollas Heights has no connections, but the spark control circuit of the distant control lines can be connected to Western Union wire at Point Loma, and if required, used on Chollas Heights telegraph connections. Time signals from Western Union are received at Chollas Heights by this method.

Comment: The San Diego station is not only a coastal station, and as such, handles commercial traffic, but is also a traffic control station, the location of the office of the Assistant District Communication Superintendent, San Francisco, and a super-primary station for transoceanic and transcontinental traffic.

The Bureau of Steam Engineering has approved a 2-KW 500 cycle spark gap transmitter to be installed at Chollas Heights for communication with Naval seaplanes and ships in the harbor and near vicinity.

U. S. Naval Radio Station, Inglewood (NWR):

Located at Inglewood, Los Angeles, California. Equipped with one (1) 15-KW arc set adjusted to wave lengths of 300, 600, 3250, 4000, and 4500 meters.

Radio Communication: Effective with San Diego and ships equipped with arc apparatus dependent on their range. Can be effected with South San Francisco, Beach (San Francisco) and San Francisco.

Telegraph connections - with Los Angeles office of the Federal Telegraph Company. The Bureau of Steam Engineering disapproved request for leased wire to Western Union Los Angeles office. This connection is believed advisable.

Comment: This station was taken over by the Navy on April 9, 1917, and has since been operated by the Naval Communication Service as a naval radio station. This station was acquired by the Government by purchase and all properties were transferred to the Government as of May 15, 1918. Its military value lies in ability to communicate with vessels in the immediate vicinity, relieving the San Diego station in handling arc traffic, should such traffic be congested; as a control station for the Chollas Heights station in the event of the temporary destruction of the Point Loma station; and as a transmitting station, both arc and sprak, to be operated by a distant control station from San Pedro, as proposed by the Pacific Coast Communication Superintendent.

This station was formerly utilized by the Federal Telegraph Company for point to point traffic with Beach (San Francisco), Grant Hotel (San Diego) and Phoenix.

U. S. Naval Radio Station, East San Pedro (NPX):

Located at East San Pedro, California. Equipped with one 5-KW 60 cycle non-synchronous rotary spark set, and a 1-KW 50 cycle nonsynchronous rotary spark set. The former is adjusted to 600 meters and the latter to wave lengths of 300, 500 and 600 (working) meters.

Radio Communications: Effective with Avalon, San Diego, and ships dependent on their range. Can be effected with Point Arguello.

Telegraph connections: With Western Union by a loop circuit from the East San Pedro depot of the Salt Lake railroad and with Submarine Base via the Western Union office, San Pedro. This line can be utilized for forwarding business from Radio Station, East San Pedro, to Los Angeles, in the event of service being interrupted over the Salt Lake Railroad line.

Comment: This station was taken over by the Navy on April 9, 1917, and has since been operated by the Naval Communication Service for handling ship to shore traffic, and traffic with Avalon, at domestic rates by agreement with the Western Union Company.

This station was purchased by the Navy and all properties were transferred to the Government as of November 30, 1918. It's purchase and retention by the Navy was recommended in view of its military value for communication with submarines and other small craft in the vicinity, and the establishment of a submarine base and naval reserve training camp at San Pedro.

* * * * *

U. S. Naval Radio Station, Avalon (NZL):

Located at Avalon, Catalina Island. Equipped with a 2-KW 60 cycle open spark set and a $\frac{1}{2}$ -KW 120 cycle quenched spark set, both adjusted to wave lengths of 300, 550 and 600 (working wave) meters.

Radio Communication: Effective with East San Pedro, San Diego and vessels, dependent on their range. Can be effected with Point Arguello.

Comment: This station was taken over by the Navy on April 9, 1917, and has since been operated by the Naval Communication Service for handling commercial traffic with East San Pedro, and further forwarding by landline to other points, at domestic rates by agreement with Western Union Company. It also handles ship traffic.

This station was purchased by the Navy and all properties were transferred to the Government as of November 30, 1918. This station affords the only means of communication other than by mail between Catalina Island and the mainland. It's purchase and retention by the Navy was recommended in view of it's military value for communication with submarines and other small craft in the vicinity, and with a patrol station should one be established on Catalina Island.

* * * * *

U. S. Naval Radio Station, Point Arguello (NPK):

Located at Point Arguello, California. Equipped with 2-KW 500 cycle quenched spark set adjusted for the following wave lengths: 600 (commercial), 756, 952 (calling) and 1512 (working) meters. The station is equipped with direction finder and radio compass.

Radio Communication: Now in effect with San Diego, Farallons, San Francisco, and ships dependent on their range. Can be effected with Avalon and East San Pedro.

Broadcasts local weather conditions at 8:00 a.m., noon, 4:00 p.m., and 8:00 p.m. Exchanges weather report with Farallons at 7:00 a.m. and 7:00 p.m. and broadcasts these reports immediately following his own weather at 8:00 a.m. daily. Furnishes weather conditions to shipping on request. Broadcasts time signals at noon daily, except Sundays and holidays, on 1512 meters. Broadcasts hydrographic information in accordance with Communication Regulations.

Telegraph connections: Looped to Western Union office at Surf, California. Unsatisfactory. Wire old and defective. Unreliable in wet weather.

Comment: This station handles commercial traffic. It is of military value for communication with submarines and other small craft operating in the vicinity.

* * * * *

Commercial Stations, San Diego Communication District:

Federal Telegraph Company Station, Grant Hotel, San Diego (KSD):

This station was taken over by the Navy on April 7, 1917 and was purchased May 15, 1918. It was later completely dismantled.

Federal Telegraph Company Station, Los Angeles (KLS):

This station was located at 206 Mercantile Place, Los Angeles, California. It was the receiving and control station from which was operated the Federal Station at 23rd and Concord Streets, Los Angeles, both of which were taken over and closed by the Navy on April 9, 1917. Both stations were purchased by the Navy May 15, 1918, and completely dismantled.

Federal Telegraph Company Station, Phoenix, Arizona (KHQ):

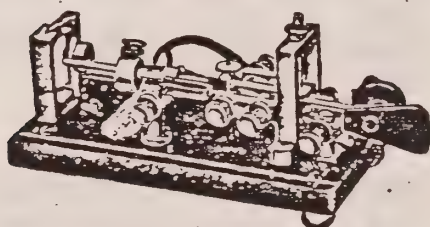
This station was neither taken over nor closed by the Navy during the war as its operation as a radio station automatically ceased as far as the Pacific Division was concerned. The station was purchased by the Navy May 15, 1918, and was later completely dismantled.

* * * * *

People of this country through their elected representatives in Congress have, by the appropriation of funds for the new Laboratory, for which we are about to break ground, give tangible evidence that their faith that through the scientific researches of the Navy Electronic Laboratory of Point Loma, the arsenal of democracy will still be able to produce a convincing argument which must, in the final analysis, back up our statesmen in perpetuating the individual liberties which are the foundation of this government. I want to congratulate the personnel of the Navy Electronics Laboratory in having bigger, better buildings in which to continue their researches, and I want to thank those who came here and worked hard when it was a small, difficult station with small facilities, and I want to congratulate the communicators who are moving into bigger and better things, and can do more communications. Thank you very much.

What takes the nerve out of nervousness? **THE VIBROPLEX.**

Trade Mark.

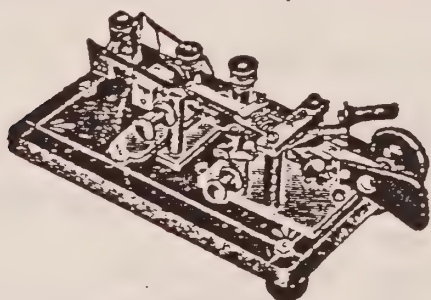


Old Style, Single Lever.

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If you do not believe that the Vibroplex is the undisputed leader, ask any of the thousands of Vibroplex users—ask the men on the heavy leased wire circuits—the men on the press circuits—the bonus men—the men that get the money—ask them about the Vibroplex—practically every one of them uses the Vibroplex.

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SPECIAL NET PRICE \$3.00

Send for catalog and circular of C.Q.A. Relays.

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 NEW YORK.

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RADIO TRANSMITTING STATIONS - thru WWII.

AND associated medium powered transmitters, 50.4 to 68 Kc.
Compiled from various sources (including recollections) for the Old Timer Communicators archives. Could be expanded into the 1970s by obtaining such information as is unclassified on the one and two megawatt installations at Jim Creek (Washington), Cutler (Maine), Lualualei, Balboa, Annapolis, Exmouth (Australia), etc.

NAVAL DIST.	YEAR	CALL	LOCATION	FREQ	KW	TYPE/ MODEL	CONTROL STA.
3rd	1918	NDD	Sayville NY		200	Arc	RN (to 1920)
4th	1917	NFF	New Brunswick NJ		50	Alt.	RN
	1918	NFF	New Brunswick NJ		200	Alt.	RN
	1917	NWW	Tuckerton NJ		100	Arc	Local and RN
Poto- mac R.	1913	NAA	Arlington Va.	36.0	100	Spark	RN
	1916	NAA	Arlington Va.	36.0	100	Arc	RN (ex Tuckerton NJ)
	1918	NSS	Annapolis Md.	17.5	500	Arc	RN
	1926?	NAA	Arlington Va.	50.4	100	Tube	RN (Same as NPL?)
	1937	NSS	Annapolis Md.	17.5	500	TBJ	RN
		NAL	Washington NYD	68.0			Local
11th	1915	NHL	Pt.Loma/Ch.Hghts.		30	Arc	Pt.Loma/North Island & foot of Broadway
	1917	NPL	Chollas Heights	30.6	200	Arc	Pt.Loma (orig 80KW)
	1926	NHL	Chollas Heights	30.6	100	Tube	" (ex USS SARATOGA)
	1930	NHL	Chollas Heights	58.0	25	TAE	
12th	1920	NFG	Mare Island	28.5	100	Arc	San Francisco
		NFG	Mare Island	42.8			
		NFG	Mare Island	62.0			
		NFG	Mare Island	66.0			
13th		NPC	Puget Sound	33.8			
		NPC	Puget Sound	56.0			
	1915	NPA	Cordova	48.0	30	Arc	
14th	1917	NFM	Pearl Harbor	26.1	500	Arc	Wailupe (orig 350KW)
	1918	NFM	Heeia	38.0	100	Arc	"
	1918	NFM	Heeia	54.0	30	Arc	"
	1932	NFM	PH/Lualualei	26.1	500	TAW	" (Wahiawa after 1941)
	1943		Haiku	19.2	200	Alt.	Wahiawa or Subbase?)
	1943?		Haiku	56.0	50	TOG	"
15th	1914	NBA	Colon		100	Spark	Balboa
	1915	NBA	Darien	46.0	100	Arc	"
16th	1917	NPO	Cavite	19.8	500	Arc	Los Banos. Cavite after
	1932	NPO	Cavite	19.8	500	TAW	" 1937
		NPO	Cavite	56.0			"
	1936	NPO	Canacao				Cavite
Carri- bean	1920	NAU	Cayey PR	33.8		Arc	San Juan
	1915	NAU	San Juan	62.0	30	Arc	Local
Wespac		NPN	Guam	32.8 & 50.4		Arc	Local
		NFU	Tutuila, Samoa		30	Arc	Local

The lists of personnel included in this section of the appendix were obtained by the historian of the Old Timers Communicators, John W. Trott, from Christmas cards and other documents provided by members, and others. Some lists were compiled strictly from names recalled by shipmates, others were provided with the group photographs included in this section.

The historian has researched the names to include first names or initials, Bellevue and San Diego Radio Materiel School class numbers, the ranks at which the men retired, their current status (living or deceased) and any other pertinent data that would be of interest to readers.

Members and others who happen to read this history can help to augment these lists by searching their scrapbooks and their memories for any records, including Christmas cards, of officers and men who served in communications at any of the radio stations in the Eleventh Naval District (and any other district or ship) from the time the station (or ship) was commissioned until at least the end of World War II.

Please send such records, or copies of them, to the historian, John W. Trott, COMDR USN Ret., 4512 Pescadero Avenue, San Diego, California, 92107.

Photographs of personnel, land, equipment and buildings at any U. S. Navy Radio Station are also solicited.

NPX RADIO SAN PEDRO -- 1920 to 1923
Partial List Only. Disestablished 6 Sep 1924.

<u>Name</u>	<u>R/R</u>	<u>Retired</u>	<u>Name</u>	<u>R/R</u>	<u>Retired</u>
CARTER, Charles W	RM		POY, Henry J	RM	
CASSIDY, C	RM		PRIEST,	RM	
COURTNEY, John B	RM		IRICHARDSON, John P	Gun	LCdr '45
CROWDER, Ira P	RM		RICHARDSON, Melvin J	RM	
CUNNINGHAM,	RM		RIETZKE, Eugene H	CRM	
			SHOEMAKER,	RM	
DAMON,	RM		THOMPSON,	RM	
FAUPEL, "Ed"	RM		TIPSWORD, Carl D	RM	RMC '43
IFISH, Frederick W	RM		or		
			TIPSWORD, Doris D	RM	RMC '
HAERER, William A	RM	Lt '45	IWOMACK,	RM	
HOLDAKOWSKI, O L	RM		WOODALL,	RM	
HOWELL,	RM		WRIGHT, J B	RM	
LaFRANCE,	RM				
ILINTNER, Harold W	RM	Lt '48			
IMcELROY,	RM				

Deceased.

! BER OTC SoCal 1984 or earlier.
ADDRESS on hand in 1984.

From names recalled by Richardson for
the period of his tour. Any errors in
first names are those made during
research.

POINT LOMA/FOOT of BROADWAY/ CHOLLAS HEIGHTS/IMPERIAL BEACH -- 1923 and 1924

RMS Cl#	Name	R/R	Retired
22	ABERNATHY, Marlo G	RM2	CWO2'53
SD7	ALVERSON, George D	RML	CWO2'48
	ASHLEY, John M	LCdr	Capt'46
	BUCHNER, Collins R	ChGun	Lt '41
	COOK, C I	RM	
	CURRENT, Paul E	CEM	
	DeLONG, Lee	RM	
	HAYES, "Tex"	RM	
13	HENDRICKSON, Luther W	RM	LCdr'48
SD6	HORSLEY, Grant E	RM	LCdr'53
16	JONES, James William	RM	LCdr'52

Deceased.

MEMBER OTC SoCal and/or NorCal
1984 or earlier.

RMS Cl#	Name	R/R	Retired
SD9	KNIGHT, Thomas V	RM	Lt '50
12	MALONEY, Jack G	RM	CWO2'52
SD3	MANNING, Herman D	RM	CWO2'47
SD10	McVEY, Charles T	RM	LCdr'53
	MEADE, Basil	RM	
	RUBRIGHT, Charles R	RM	CWO2'43
?SD3?	SCOTT, H J	RM	
	WATKINS,	CRM	

Compiled for the OTC archives from names recalled in 1975. San Diego and Bellevue class numbers, if known, added for cross reference. Any errors in first names are those made during research.

S	#	Name	Rate	Retired	RMS	Cl#	Name	Rate	Retired
		ARMSTRONG, Geo Custer	CRM				LESKO, Frank J	RM	RMC '??
		BEASLEY, Marion D	RM3				LITTLEFIELD, Perley E	CRM	CWO2'43
		BAGLEY, Francis M	RM	CWO2'51		20	LUCERO, Arthur A	RM	CWO2'49
7		BRIGHT, G H	RMI				MAYER, Harry E	SC2	
		or					MERCHANT, Charles F	RM3	
		BRIGHT, Glen Franklin	RMI	RMC '??			MILLER	RM	
		CHILDRESS, John W	CRM				MOORE	RM	
							MUSHRUS	RM3	
		ENGLISH, E Dudley	RM	Lt '50		10	O'NEILL, Leroy A	RM2	Lt '50
7		FEDERLE, Karl J	RMI	LCdr'53			PATTON, Eber	RM	RMC '??
1		FORD, Shuyler R	CRM		SD 6		PERREAULT, Edgar L	RMI	WO1 '45
							PULVER, Hyman	RM3	
7		GARRETT, Lusta Lee	RMI	Lt '51	SD 8		SHALES, Arthur F	RMI	WW2 CRM
		GILBERT, Samuel S	CRM	CWO2'43	SD 7		SROCZYNSKI, Eugene S	RMI	Ltjg'??
5		GREENWELL, Peter A E	RMI	Lt '41	SD 5		STACY, Harold J	CRM	WO1 '45
							STONE, Arthur E	Y3	
		HEVENER	RM2						
		HUNGATE, Albert L	RM		SD 4		TIPSWORD, Doris D	CRM	RMC '??
		JONES, James William	RM	LCdr'52	SD 6		WELSCH, Elmer M	RMI	Lt '50
		KNIGHT, Clarence E	CRM						

Deceased.

MEMBER OTC SoCal and/or NorCal
1973 or earlier.

ADDRESS on hand in 1975.

From pictures belonging to Welsch, Federle and Knight. San Diego and Bellevue class numbers, if known, added for cross reference. Any errors in first names are those made during continuing research.

NFL RADIO CONTROL STATION POINT LOMA — Dec 1930

RMS CL#	Name	Rate	Retired
	APPLE, William E	CRM	
D4, 21, 29	BISEL, Paul E	RM1	
	BOYD, Lowell K	RM1	Lt '54
	BULLER, Forrest L	Y2	CWO4'55
	CLARK, H R	CRM	
	or		
	CLARK, Harold R	CRM	Ltjg'??
	DAWKINS, H H	RM1	
	DEAUGUSTINE, Frank R	CRM	Lt '??
19	EXTON, Thomas H	RM1	Lt '51
	CARVER, D I	RM1	
	or		
23	CARVER, David C	RM1	CWO2'53
	GIBSON, James L	RM2	
30	HALPIN, John B	RM2	Cdr '57
25	HARDCASTLE, Wm Raymond	RM1	CWO2'54
	JOHNSON, C A	RM2	
	KENDALL, Clyde E	RM2	CWO4'57
23, SD9	KITTS, Ishi Reu	RM1	(1)
	KITTS, Irving Richard		Ltjg'49
	KNAPP, Edward A	RM2	

Deceased.

MEMBER OTC SoCal and/or NorCal
1972 or earlier.

ADDRESS on hand in 1978.

(1) Kitts changed his name to
Irving Richard Kitts.

RMS CL#	Name	Rate	Retired
	LANG, Albert L	CRM	
	MILLER, Leslie B	RM2	CWO '54
	MOBLEY, Ray R	CStd	
	MORGAN, James Samuels	RM2	Lt '55
	NORMAN, John A	RM2	
SD 9	NORWOOD, Carroll H	RM1	Cdr '57
15	SCHOONOVER, Melvin E	RM1	RMC '45
	STIEBENTHAL, Jesse F	RM1	LCdr'55
	SKEWES, Paul F	CRM	RMC '
SD 7	SRÓCZYNSKI, Eugene S	RM1	Ltjg'??
	STENTZ, Erwin C	RM1	
SD 7	IVANDEKAMP, Garrett	RM1	
18	WALRUFF, Charles A	RM1	Cdr '55
	WARE, E G	RM1	
	or		
	WARE, Everett L	RM1	
11	WILLSON, John Roy	RM1	LCdr'56

From a Xmas card donated to the OTC
archives by R. D. Johnson. Bellevue
and San Diego class numbers, if known,
added for cross reference. Any errors
in first names are those made during
research in 1971.

NFL RADIO CONTROL STATION POINT LOMA — Dec 1931

RMS Cl#	Name	Rate	Retired
	BACKER, Henry C	RM2	RMC '
	BOYD, Lowell K	RM1	Lt '54
	BULLER, Forrest L	Y2	CWO2'55
	CLARK, H R "Stormy"	CRM	
	or		
	CLARK, Harold R	CRM	Ltjg'??
28	CLOUD, Warren T	RM1	LCdr'55
	COOK, Lorenz A	SCI	
	DeAUGUSTINE, Frank R	CRM	Lt '??
19	EXTON, Thomas H	RM1	Lt '51
30	HALPIN, John B	RM2	Cdr '57
12	KELLY, Chester J	RM1	CRM '42
	MALONE, G M	RM2	
	or		
	MALONE, Gipson H	RM2	RMC '??
	OGLETREE, Forrest C	RM1	

RMS Cl#	Name	Rate	Retired
	POWELL, Edwin S	CRM	RMC '41
	QUESNEL, Charles W	RM2	
	ROSS, William D	CRM	
23	RUDY, Clyde W	RM1	CWO2'49
	SHERWOOD, Raymond N	RM1	
	SKENES, Paul F	CRM	RMC '
	SKENES, P F (in '30)	CRM	
	SMITH, J	RM1	
	or		
SD 8	SMITH, James S (in '32)	RM1	LCdr'50
23, 28	SMITH, Mearl R	RM1	CWO2'51
SD 7	SROCZYNSKI, Eugene S	RM1	Ltjg'??
SD 4	TIPSWORD, Doris D	CRM	RMC '
26	VIOLETT, Sam O	RM2	Cdr '57
	WILEY, Ronald E	RM2	
11	WILLSON, J Roy	RM1	LCdr'56

Deceased.

MEMBER OTC SoCal and/or NorCal
1972 or earlier.

NON-MEMBER OTC; address available.

From a Xmas card donated to the OTC archives
by Stoddard. San Diego & Bellevue class
numbers, if known, added for cross reference.
Any errors in first names are those made
during research in 1972.

RMS Cl#	Name	Rate	Retired
17	<u>BOZEMAN</u> , Homer D	RML	Lt '53
	EASON, W R	SC	
	<u>MAGARIS</u> , Paul L	RML	
		CRM 10-31-41	

Deceased.
MEMBER OTC SoCal and/or NorCal
 1984 or earlier.
ADDRESS on hand in 1984.

RMS Cl#	Name	Rate	Retired
	<u>SCHULTZ</u> , Martin G	RM	
	<u>SPOONER</u> , E G	RM	
	WUEST, Elmer	RM	
	<u>ZELK</u> , George S	CRM	CWO2 '46

From copy in OTC archives of Xmas card
 belonging to Purnell. Rates assumed from
 card sequence, or determined from other
 sources. Bellevue class number, if known,
 added for cross reference. Any errors in
 first names are those made during research.

11th NAVDIST RADIO STATIONS — DEC 1932

RMS CL#	Name	'32 R/R	Retired
	ABEL, Alfred O	SC2	
	ALEXANDER, George W.	RM2	CTC '??
D-6	ANDERSON, Leonard L D	RM1	RMC '46
26	ANDREWS, Carroll C	RM2	LCdr '57
	ARGABRIGHT, Samuel C	RM2	
	AYERS, Gordon M	CRM	
	BACKER, Henry C	RM2	RMC '
	BASINGER, Herman A	RM2	
	BEAUCHAMP, Alton	RM1	
	BOWMAN, Charles H	RM2	
	BROOKS, Samuel D	RM2	
29	BUSBY, Henry Roy	RM2	Cdr '58
	CARTER, Harold	YL	
	CASINO, Frank R	RM2	RMC '
	CLOPPER, Charles H	SCI	
28	CLOUD, Warren T	RM1	LCdr '55
29	DAHLGREN, John A.	RM2	
SD 8	DAWES, Henry L	CRM	Lt '44
	DeANDREA, Frank A.	RM2	
24	DOBBS, Horace F	RM1	'6-4-42 CRM
	FOSTER, Everett J	RM2	
	GADE, William C	SCI	
	GALLAGHER, Donald M	CRM	CWO2'??
	GARDNER, Gordon C	RM2	
	GARRETT, George M	SC2	
	GILBERT, Samuel S	CRM	CWO2'43
	GRIFFIN, Howard A	YL	Ltjg '53
22	GRIPPEN, Wilford C	RM2	
22	HURST, Edward L	RM1	CWO2'54
	INGLIS, Thomas B	LCdr	VAdm '52
	JACOBS, Gerald M	RM2	LCdr '57
SD9	JOHNSTON, Edmund A	RM1	CRM '51
	JOHNSON, Walter C	RM2	
	JONES, Alfred David	RM1	Lt '53
21	JONES, David M	RM2	Cdr '55
12	KELLY, Chester J	RM1	CRM '42
	KIMES, Thomas J		Ltjg Capt '47
	KNOBEL, John T	SL	
	KNOTH, Henry W	MM1	
	KOSKO, John F	CY	CWO2'47

RMS CL#	NAME	'32 R/R	Retired
29	LEE, Lemuel L	RM2	CWO2'58
	LEMPKE, Henry L	CRM	
SD7	LEWIS, Ernest P	CRM	
	LOVELL, Joseph F	MM1	CWO2'48
	McCARTY, Michael	RM1	
	MITCHELL, Herbert R	CRM	
	MONTGOMERY, Robert	RM2	
28	MULLINS, Carl B	RM2	CWO2'50
32	MYLES, Clyde W	RM2	LCdr '57
	NAUMAN, Jared E	RM2	
SD6	NISLEY, Elmer O	CRM	
SD9	O'BRIEN, John M	RM1	Lt '52
	OGLETREE, Forrest C	RM1	
9	OLESON, William M	CRM	Lt '53
	PATTEN, Stanley F	Lt	RAdm '47
	PIERSON, Claude E	RM2	
	POWELL, Edwin S	CRM	RMC '41
	PRONIER, Anthony B	CRE	CWO4'43
	QUESNEL, Charles W	RM2	
21	REED, William Albert	RM1	Lt '54
	RHOADS, Forrest A	Lt	RAdm '50
23	RUDY, Clyde W	RM1	CWO2'49
SD 9	SCHMIDT, Cyrenus I	RM1	WO1 '52
	SCOLLARD, Philip T	S2	
	SEIPLE, Kenneth J	RM2	
	SHERWOOD, Raymond N	RM1	
	SLOSER, Myron	RM1	
	SMITH, Jack H	PhM1	
SD 8	SMITH, James Stephen	RM1	LCdr '50
23, 28	SMITH, Mearl Raymond	RM1	CWO2'51
28	STEIN, Sam	RM1	
	TERRY, Clive H	RM2	
SD 4	TIPSWORD, Doris D	CRM	
	VANDERHOFF, Frank N	RM2	LCdr '56
26	VIOLETT, Sam O	RM2	Cdr '57
	WALKER, Lewis W	CRM	RMC '47
	WEAVER, Ira A	CRM	CWO2'43
	WHITNEY, Howard H	RM1	RMC '
	WILLIAMS, Frank	CY	LCdr '53
26	WILLIAMS, Frederick E	RM2	Cdr '55
19	WUNDER, William B	RM1	Lt '53

Deceased.

MEMBER OTC SoCal and/or NorCal
1973 or earlier.

NON-MEMBER OTC; address available.

Names, and ranks/rates from a Xmas card
donated by "Abe" Abernathy. Any
errors in middle names are those made
during research in 1970.

11th NAVDIST RADIO ACTIVITIES — Dec 1933

RMS CL#	Name	R/R	Retired	RMS CL#	Name	R/R	Retired
8	I ALBERSMEYER, Edwin C	RM1	WO1 '52	28	I JACOBS, Gerald M	RM2	LCdr '57
SD 6	I ANDERSON, Leonard L D	RM1	RMC '46		JAMES, Henry e	RM2	
24	I ANGVICK, Andrew J	RM1	CWO2 '55	SD10	I JOLLY, Chester C	RM1	RMC '44
	ARGABRIGHT, Samuel C	RM2			KNOBEL, John T	SL	
	ASHCRAFT, Charles H	SC2			LANDE, Joseph	CY	
	AYERS, Gordon M	CRM		SD9	LATTIMORE, Leon V	CRM	
	I BASINGER, Herman A	RM2		29	LEE, Lemuel L	RM2	CWO2 '58
	I BEAUCHAMP, Alton	RM1		SD7	I LEWIS, Ernest P	CRM	
29	I BORDEN, Clifford L	RM1	LCdr '54		LITTLE, Ralph N	RM2	
	BOS, Paul Everett	RM2	ALC '48	12	MARECK, Albert J	RM1	(1)
	BOWMAN , Charles H	RM2			McCARTY, Michael	RM1	
29	BUSBY, Henry Roy	RM2	Cdr '56		I MONTGOMERY, Robert	RM2	
	BYRON, William C	CY		14	MULLIGAN, John F	RM1	
	I CALDWELL, Rex S	Ltjg	Capt '56	28	I MULLINS, Carl B	RM2	CWO2 '50
	CAMPBELL, John	RM1			MURPHY, P J	RM1	
	CARTER, Harold	Y1		SD10	I MURRAY, William B	CRM	
	I CLARKE, Frank H	RM1	Cdr '54	32	MYLES, Clyde W	RM2	LCdr '57
	CLOPPER, Charles H	SC1		9	OLESON, William M	CRM	Lt '53
30	I COOK, Aaron S	RM2	CWO2 '56	7	PARKS, Paten E	CRM	Lt '49
	DARSEY, John D	CRM	CWO2 '43		I PHILLIPS, Byron	CRM	LCdr '??
	DICKERT, Robert E	RM1	Lt '53	21	I REED, William A	RM1	Lt '54
	DUVALL, James G	RM1			I RHOADS, Forrest A	Lt	Radm '50
	I EACRET, O Ray	RM2	RMC '??	25	I RHODES, Hamilton E	RM2	LCdr '56
	EVENING, E L	RM1			SABEAN, Jeremiah, C	RM2	WO1 '56
	or			15	I SCHMIDT, Cyrenus I	RM1	Cdr '??
	I EVANS, Everett L	RM1	Ltjg '54	SD 9	I SCHMIDT, Cyrenus I	RM1	WO1 '52
	FOSTER, Everett J	RM2			SCHWENN, Frank C	RM2	
27	I FULLER, Bert C	RM1	LCdr '53		I SEARS, Charles A	RM2	CWO2 '55
	GADE, William C	SC1			SEIFLE, Kenneth J	RM2	
	I GALLAGHER, Donald M	CRM	CWO2 '??	26	SEIMENS, G M	RM2	
32	I GANNON, William F	RM2	CWO2 '57		SMITH, J R	PhM1	
	GARRETT, George M	SC2			or		
	I GILBERT, Samuel S	CRM	CWO2 '43		SMITH, Jack H (in '32)	PhM1	
	GREEN, H R	SL			TERRY, Clive H	RM2	
	GRIFFIN, Howard A	Y1	Ltjg '53	25	I TRAGER, Bernard L	RM2	LCdr '55
	HAFDELL, G A	S2			VANDERHOFF, Frank N	RM2	LCdr '56
	I HAISLIP, Leondous	RM1	CWO2 '51	SD9	I WATEROUS, William L	CRM	CWO3 '53
	HERMAN, L A	RM2			I WEAVER, Ira A	CRM	CWO2 '43
12	HILAR, Albert P	(1)	Capt '52		WEISS, L G (LJ '34 & '35)	RM2	
	HIKSON, John P	CRM	Lt '46		WOODNORTH, Milton R	RM2	LCdr '56
33	I HOGGE, Selwyn F	RM2	LCdr '56		I WRIGHT, Albert M	Lt	Cdr '43
22	I HURST, Edward L	RM1	CWO2 '54				
	I INGLIS, Thomas B	LCdr	VAdm '52				

~~I~~Deceased.

MEMBER OTC SoCal and/or NorCal
1977 or earlier.

NON-MEMBER OTC; address available.

(1) Marek changed his name to Hilar.

From a Xmas card (initials only 1c & below)
donated to the OTC archives by "Abe"
Abernathy. Bellevue & San Diego class
numbers added here for cross reference.
Any errors in first names are those made
during research in 1970.

11th NavDist RADIO ACTIVITIES -- Dec 1934

LMS Cl#	Name	R/R	Retired	RMS Cl#	Name	R/R	Retired
8	ALBERSMEYER, Edwin C	RM1	WO1 '57	18	JACOBS, Harry B	RM1	CWO2'52
24	ANGVICK, Andrew J	RM1	CWO2'55		JOHNSON, Francis H	RM2	RMC '??
	ASHCRAFT, Charles H	SC2					
	BECKNER, Glenn W	Y1		18	KELLY, Leo F	RM1	
	BIRKET, Charles T	SC2			KENT, H G	CMM	
17	BONTEMPO, Felix A	RM1	CWO2'52		LANDE, Joseph	CY	
29	BORDEN, Clifford L	RM1	LCdr'54		LARSEN, Marius A	PhM1	
	BOS, Paul E	RM2	ALC '48	SD9	LATTIMORE, Leon V	CRM	
	CAMPBELL, John	MM1			LEMAN, E Clifford	RM2	
SD8	CARLISLE, Woodford J	CRM	CWO2'43		LITTLE, Ralph N	RM2	
	CLOPPER, Charles H	SC1			MacCALMAN, Donald J	Lt	Cdr '46
	COLLINS, Carl W	CY	LT '54		McNEEL, W L	RM1	
30	COOK, Aaron S	RM2	CWO2'56	14	MULLIGAN, John F	RM1	
18	CULL, E Harvey	RM1	RMC '47		MURPHY, P J	RM1	
	DARSEY, John D	CEM	CWO2'43		MURRAY, Hallard T	RM2	Ltjg'56
	DICKERT, Robert E	RM1	Lt '53	SD10	MURRAY, William B	CRM	
24	DILMORE, Frank A	RM1	CWO2'52				
	DUVALL, James G	RM1		7	PARKS, Paten E	CRM	Lt '49
	EACRET, O Ray	RM2	RMC '??		PHELPS, Otto R	RM2	ATC '??
	EDGAR, Campbell D	CDR	RAdm'47		PHILLIPS, Byron	CRE	LCdr'??
	ELLIS William E Jr	RM2	RMC '??	SD7	PUTMAN, Joseph W	CRM	RMC '??
					REAVES, W A	RM2	
34	FILLEBROWN, Thornton B	RM2	CRM WW2	15	REED, Claude C	RML	CWO2'50
34	FITZGERALD, Eugene H	RM1	CWO2'59	25	RHODES, Hamilton E	RM2	LCdr'56
	FOSTER, F	S1			SABEAN, Jeremiah C	RM2	WO1 '56
SD10	FOWLER, James A	CRM	CWO2'49		SEARS, Charles A	RM2	CWO2'55
27	FULLER, Bert C	RM1	LCdr'53	26	SEMMENS, G M	RM2	
					SHURLEY, Tom C	RM2	RMC '57
32	GANNON, William F	RM2	CWO2'57		SNYDER, I	RM2	
	GARRETT, George M	SC2			STEPHENS, Eugene W	CRM	
18	GARRISON, Frank W	RM1	Lt '52		STUART, Robt B	AsstSupt	
28	GILLISPIE, Thomas J	RM1	LCdr'54				
	GRACZ, Edmund F	RM1		25	TRAGER, Bernard L	RM2	LCdr'55
10	GRAHAM, Loys V	CRM	RMC '42		TYSON, Alfred J	RM2	
	GREEN, H R	S1		SD9	WATEROUS, William L	CRM	CWO3'53
	HAISLIP, Leondous	RM1	CWO2'51		WEISS, L J	RM2	
	HARMON, August W	CRM			WHITE, C L	RM2	
12	HILAR, Albert P	RM1	Capt'52		WILLIAMS, C E	S1	
	HIXSON, John P	CRM	Lt '46	29	WINN, Robert E	RM1	CWO2'58
31	HOGGE, H G	RM2			WISNER, Fred M	ARdoEngr	
33	HOGGE, Selwyn F	RM2	LCdr'56		WOLFE, A E	CRM	
SD3	HUMPHREYS, Harry C	CRM			WOOD, Kathryn B	Secy	
					WOODWORTH, Milton R	RM2	LCdr'56
	INGLISH, Robert E	CY			WRIGHT, Albert M	Lt	Cdr '43
					WRIGHT, Merl	RM1	

Deceased.

MEMBER OTC SoCal and/or NorCal
1984 or earlier.

ADDRESS on hand in 1984.

From a copy in the OTC archives of a Xmas
card belonging to LaMorie. San Diego and
Bellevue class numbers, if known, added
for cross reference. Any errors in first
names are those made during research.

11th NavDist RADIO ACTIVITIES -- Dec 1935

MS 1#	Name	R/R	Retired	RMS Cl#	Name	R/R	Retired
	ATKINS, Frank J	RM1			KEEN, A D	RM2	
	BECKNER, Glenn W	Y1		18	IKELLY, Leo F	RM1	
	BIRKET, Charles T	SC2		SD7	IKEMPSEY, Vincent D	CRM	Lt '50
	BOATRIGHT, Lawrence E	RM2			KINNEY, Philip R	Lt	Capt '47
17	BONTEMPO, Felix A	RM1	CWO2 '52		LALLY, Joseph	CRM	
	BOOZER, Robert D	RM1	RMC '??		LARSEN, Marius A	PhM1	
SD8	CARLISLE, Woodford J	CRM	CWO2 '43		LEMAN, E Clifford	RM2	
	CARR, John J	CEM		31	LOCKE, R R	RM2	
	CLARK, R T	SC1			LONG, Dale	RM1	
	COLLINS, Carl W	CY	Lt '54	31	McKEOWN, Edward C	RM1	Ltjg '57
13	CONDON, James D	CRM	CWO2 '53	20,30	MOORE, Joseph P	RM1	Lt '47
31	CONNOR, William A	RM1	CWO2 '53		MORLEY, William R	CRE	LCdr '50
	CORTSEN, F C	SC3			MULLIKIN, T G	S1	
18	CULL, E Harvey	RM1	RMC '47		MURRAY, Hallard T	RM2	Ltjg '56
	DENISON, Carl B	CRM	Lt '49		OTTINGER, L	S1	
	DEROUEN, J A	MM2			PALMER, Hasford H	RM2	
24	DILMORE, Frank A	RM1	CWO2 '52	32	PHILLIPS, Paul B	RM2	LCdr '56
	DOTY, Elmer L	RM2			PHILPS, Otto R	RM2	ATC '??
	EDGAR, Campbell D	Cdr	RAdm '47		PROFFER, John W	CRM	Lt '49
	ELLIS, William E Jr	RM2	RMC '??	SD7	PUTMAN, Joseph W	CRM	RMC '??
20	ENGLISH, E Dudley	RM1	Lt '50		REAVES, W A	RM2	
	FILLEBROWN, Thornton B	RM1	IWW2 CRM		RUNYON, Frank C	CY	
	FITTS, C R	RM1			SAMMONS, Donnie D	RM2	Lt '53
34	FITZGERALD, Eugene H	RM1	CWO2 '59	15	SCHOONOVER, Melvin E	RM1	RMC '45
	FOSTER, F	S1			SHEARS, Karl R	Cdr	Cdr '42
SD10	FOWLER, James A	CRM	CWO2 '49		SHURLEY, Tom C	RM2	RMC '57
27	FULLER, Bert C	RM1	LCdr '53		SNYDER, I	RM2	
	FURTHMYRE, J J	RM1		SD9	SPENCER, William C	CRM	Lt '50
18	GARRISON, Frank W	RM1	Lt '52		STEPHENS, Eugene W	CRM	
28	GILLISPIE, Thomas J	RM1	LCdr '54		STEPP, Howard J	RM1	ALC '??
	GRACZ, Edmund F	RM1			STUART, Robert B	AsstSupt	
10	GRAHAM, Loys V	CRM	RMC '42		Van KAMMEN, Daniel P	SC3	CWO2 '58
19	GREER, William L	RM1	WO1 '58		VINES, Karl E	CY	CWO2 '46
	HARMON, August W	CRM			WEISS, L J	RM2	
31	HARRIMAN, Russell G	RM2	Cdr '55		WHITE, C L	RM2	
	HENDRICKS, Edward C	RM2	CWO2 '59	29	WINN, Robert E	RM1	CWO2 '58
31	HOGGE, H G	RM2			WISNER, Fred M	ARdoEngr	
	HUBBARD, Arthur G	RM2	CWO2 '57		WOLFE, A E	CRM	
SD3	HUMPHREYS, Harry C	CRM			WOOD, Kathryn B	Secy	
18	JACOBS, Harry B	RM1	CWO2 '52		WRIGHT, Merl	RM1	
	JOHNSON, Francis H	RM2	RMC '??		YCUNG, Edmund C	RM2	Lt '52

Deceased.

MEMBER OTC SoCal and/or NorCal
1981 or earlier.

ADDRESS on hand in 1981.

From a Xmas card donated to the OTC archives
by Stoddard. San Diego and Bellevue class
numbers, if known, added for cross reference.
Any errors in first names are those made
during research.

11th NavDist RADIO STATIONS -- Dec 1936

RMS Cl#	Name	R/R	Retired	RMS Cl#	Name	R/R	Retired
	ATKINS, Frank J	RM1		31	McKEOWN, Edward C	RM1	Ltjg '57
	BAUGHMAN, E G (or EC)	RM1		20,30	MOORE, Joseph P	RM1	Lt '47
	BECKNER, Glenn A	Y1			MURLEY, William R	CRE	LCdr '50
	BOATRIGHT, Lawrence E	RM2			MULLIKIN, T G	S1	
	BOOZER, Robert D	RM1	RMC '??				
	BREITBACH, A G	SC3		W24	NAGURSKI, Stephen	RM2	CWO4 '60
SD8	CARLISLE, Woodford J	CRM	CWO2 '43		O'LEARY, Francis V	CY	LCdr '52
	CARR, John J Jr	CEM			OTTINGER, L	S1	
	CLARK, R T	SC1			PALMER, Hasford H	RM2	
31	CONNOR, William A	RM1	CWO2 '53		PECH, Anthony V	RM2	LCdr '55
	CRAIGHEAD, Garland R	RM2	LCdr '56	32	PHILLIPS, Paul B	RM2	LCdr '56
	DENISON, Carl B	CRM	Lt '49		PRATT, Joseph W	RM2	RMC '??
	DOTY, Elmer L	RM2			PROFFER, John W	CRM	Lt '49
	EDGAR, Campbell D	Cdr	Radm '47	SD7	PUTMAN, Joseph W	CRM	RMC '??
	ELLIS, William E Jr	RM2	RMC '??		REAVES, W A	RM2	
20	ENGLISH, E Dudley	RM1	Lt '50		RIDER, Gilbert E	RM1	CWO2 '56
	FITTS, C R	RM1			ROBEY, C E	RM2	
34	FITZGERALD, Eugene H	RM1	CWO2 '59		ROBINSON, Stewart H	RM2	CWO2 '57
	FOSTER, F	S2			ROBshaw, F H	PhM1	
SD10	FOWLER, James A	CRM	CWO2 '49		RUNYON, Frank C	CY	
	FULLER, Harry/Herbert	RM1			SAMMONS, Donnie D	RM2	Lt '53
	FURTHMYRE, J J	RM1		15	SCHOONOVER, Melvin E	RM1	RMC '45
	GRACZ, Edmund F	RM1			SEARY, C E	MM1	
10	GRAHAM, Loys V	CRM	RMC '42		SHEARS, Karl R	Cdr	Cdr '42
19	GREER, William L	RM1	WO1 '58		SHURLEY, Tom C	RM2	RMC '57
	HARMON, August W	CRM			SMITH, C L	SC1	
31	HARRIMAN, Russell G	RM2	Cdr '55	SD9	SPENCER, William C	CRM	Lt '50
	HAYES, John F	MM1			STEPHENS, Eugene W	CRM	
	HINER, Watkins M	RM2			STEPP, Howard J	RM1	ALC '??
33	HINES, William F	RM1	LCdr '57		STUART, Robert B	RMO Asst	
	HORNEY, Albert E	RM2	CWO3 '59		TOWNSEND, Gordon E	RM2	LCdr '60
	HUBBARD, Arthur G	RM2	CWO2 '57		TUREGANO, Bernard W	RM2	CWO3 '57
SD3	HUMPHREYS, Harry C	CRM		W21	TWEED, George R	RM2	Lt '51
	JOHNSON, Francis H	RM2	RMC '??	SD7	VANDEKAMP, Garrett	RM1	
	KEEN, A D	RM2			VINES, Karl E	CY	CWO2 '46
18	KELLY, Leo F	RM1		32	WEATHERBIE, James A	RM2	Cdr '56
SD7	KEMPSEY, Vincent D	CRM	Lt '50	31	WELCH, Joseph W	RM1	
	KINNEY, Philip R	LCdr	Capt '47	32	WILSON, George L Jr	RM1	LCdr '56
	LALLY, Joseph	CRM		29	WINN, Robert E	RM1	CWO2 '58
29	LeROY, John S Jr	RM1	IRE5-31-42		WISNER, Fred M	ARdoEngr	
31	LONG, Dale	RM1			WOLFE, A E	CRM	
					WOOD, Kathryn	Steno	
					YOUNG, Edmund C	RM2	Lt '52

Deceased.

MEMBER OTC SoCal and/or NorCal
1984 or earlier.

ADDRESS on hand in 1984.

From copy in the OTC archives of Xmas card
belonging to Prather. San Diego, Bellevue
& WORES class numbers, if known, added for
cross reference. Any errors in first names
are those made during research.

11th NavDist RADIO STATIONS -- Dec 1937

RMS	Cl#	Name	R/R	Retired	RMS	Cl#	Name	R/R	Retired
		ATKINS, Frank J	RML				McBRIDE, J R	SC3	
		BAUGHMAN, E C (or EG)	RML		31		McKEOWN, Edward C	RML	Ltjg'57
		BOATRIGHT, Lawrence E	RML	CivS'69	13		McLEAN, Colin W	CRM	Lt '49
SD7		BOWEN, Mason A	CRM	RMC '42	12		METZ, Hugh C	CRM	RMC '??
		BRETHERTON, Van F	RML		20,30		MOORE, Joseph P	RML	Lt '47
		BRYAN, E	RML				MORRISON, Edward D	RM2	
		BURGESS, J J	SL						
		CAREY, Walter L	Y2	LCdr'58	W24		NAGURSKI, Stephen	RM2	CWO4'60
		CLARK, R T	SC1				NIELSON, Roy V	RM2	
22		COE, Burl	RML	LCdr'55			O'LEARY, Francis V	CY	LCdr'52
31		CONNOR, William A	RML	CWO2'53			OTTINGER, L	SL	
		CRAIGHEAD, Garland R	RM2	LCdr'56			PRATT, Joseph W	RM2	RMC '??
							PROFFER, John W	CRM	Lt '49
		DENISON, Carl B	CRM	Lt '49			RANEY, Chester O	SL	CWO4'59
W3		DESROSIERS, Joseph E	CRE	LCdr'46			REAVES, W A	RM2	
42		DIPBOYE, Jesse J	RM3	LCdr'58			REYNOLDS, Bruce H	RM2	LCdr'62
		DONALDSON, D D	MM1				RIDER, Gilbert E	RML	CWO2'56
							ROBINSON, Stewart H	RM2	CWO2'57
		FITTS, C R	RML				ROBshaw, F H	PhM1	
		FOSTER, F	S2				RUNYON, Frank C	CY	
		FULLER, Harry/Herbert	RML						
		FURTHMYRE, J J	RML						
19		REER, William L	RML	WO1 '58	15		SAMMONS, Donnie D	RML	Lt '53
							SANDBERG, Floyd M	CRM	Cdr '50
		HARGIS, David A	RML	RMC '47	24		SCHOONOVER, Melvin E	RML	RMC '45
		HARMON, August W	CRM				SCHWEIZER, Earl G	RML	Cdr '69
31		HARRIMAN, Russell G	RM2	Cdr '55			SKAGGS, M	CEM	
23		HARRISON, Howard V	RML		10		SMITH, Grevlin P	RM2	
33		HASKIN, John E	RM3	LCdr'56	SD9		SPEARS, Travis B	CRM	Lt '52
SD5		HILDERBRAND, Henry L	CRM	Ltjg'50	SD4		SPENCER, William C	CRM	Lt '50
		HINER, Watkins M	RM2				STIXRUD, Earl T E	CRM	RMC '??
33		HINES, William F	RML	LCdr'57			STODDARD, Elmer G	RM2	CWO2'58
		HIVELY, Jack	SC1				STUART, Robert B	Rdo Engr	
		HORNBY, Albert E	RM2	CWO3'59			TERHUNE, John A	Cdr	Cdr '47
		HUBBARD, Arthur G	RM2	CWO2'57	AE3		TOWNSEND, Gordon E	RM2	LCdr'60
		HUCKINS, Thomas A	Lt	Capt'54			TUREGANO, Bernard W	RM2	CWO3'57
		HURLEY, David C	CY		W21		TWEED, George R	RM2	Lt '51
		JARSON, Maurice M	CRM	Lt '49	SD7		IVANDEKAMP, Garrett	RML	
		KEEN, A D	RM2				VanKAMMEN, Daniel P	SC3	CWO2'58
SD7		KEMPSEY, Vincent D	CRM	Lt '50	32		WEATHERBIE, James A	RM2	Cdr '56
					31		WELCH, Joseph W	RML	
		LaMORIE, C Joseph	RM2	RMC '53	32		WILSON, George L Jr	RML	LCdr'56
17		LOBDELL, Wilbur C	RM2	CWO2'50			WOOD, Mrs Kathryn	Steno	
		LOCKE, R R	RM2				WRAY, N M	SL	
31		LONG, Dale	RML				YOUNG, Edmund C	RM2	Lt '52

ceased.

MEMBER OTC SoCal and/or NorCal
1984 or earlier.

ADDRESS on hand in 1984.

From Xmas card donated to OTC archives by
Dave Brown. San Diego, Bellevue, WORES &
Aviation Electronics Officers class numbers,
if known, added for cross reference. Any
errors in first names are those made during
research.

11th NavDist Radio Stations -- Dec 1938

RMS Cl#	Name	R/R	Retired	RMS Cl#	Name	R/R	Retired
	BAUGHMAN, E G	RM1		23	MANERS, William T	CRM	
	BIRCH, C F USMC	Pvt		13	McLEAN, Colin W	CRM	Lt '49
	BISHOP, J USMC	Pvt			MILLS, L L USMC	Pvt	
	BLAKELY, E N	RM2		W24	NAGURSKI, Stephen	RM2	CWO4 '60
	BOUDREAUX, Anthony A	RM2			NICHOLSON, Louis L	RM1	LCdr '58
SD7	BOWEN, Mason A	CRM	RMC '42		NIELSON, Roy V	RM1	
	BRANTLEY, R E USMC	Pvt			NOLAN, E R	SC1	
	BRYAN, E	RM1			NORVELLE, Alton E	RM2	
	BURGESS, J J	S1			O'LEARY, Francis V	CY	LCdr '52
	CAREY, Walter L	Y2	LCdr '58		OSBORN, J W	RM2	
22	COE, Burl	RM1	LCdr '55		PUCKETT, Dewey D	RM2	RMC '56
	COMBE, F D	PhM1			RANEY, Chester O	S1	CWO4 '59
	CONLEE, L T USMC	Pvt			REDMAN, J M	RM2	
	CRAIGHEAD, Garland R	RM2	LCdr '56		REYNOLDS, Bruce H	RM2	LCdr '62
	DANIEL, C N	RM2			RICHARDS, Harold W	RM2	
	DAW, M M (HH in '39)	CRM		17-44	RIPPARD, Eugene L	RM2	CWO4 '57
	DAWSON, Cecil L	RM2			SAMS, George O	RM1	Lt '52
	DEESE, David E	RM1		6	SANDBERG, Floyd M	CRM	Cdr '50
W3	DESROSIERS, Joseph E	CRE	LCdr '46	24	SCHWEIZER, Earl G	RM1	Cdr '69
5-42	DIFBOYE, Jesse J	RM2	LCdr '58		SCOFIELD, R E	S1	
W19	DUNHAM, Robert W	RM2	LCdr '58		SMITH, Grevlin P	RM2	
	FAY, Robert C	RM2		10	SPEARS, Travis B	CRM	Lt '52
	FESSENDEN, Clifford D	RM1	RMC '??		SPENCER, D C	RM2	
	FOSTER, Wesley A	RM2	CWO2 '55		STABB, Elmer F	CRM	CWO2 '49
	GALLAGHER, William F	CEM	CWO2 '50		STEPANOVICH, Marko M	S1	CWO4 '57
33	HALLIBURTON, Robert L	RM1	Ltjg '55	SD4	STIXRUD, Earl T E	CRM	RMC '??
	HARGIS, David A	RM1	RMC '47		STODDARD, Elmer G	RM2	CWO2 '58
23	HARRISON, Howard V	RM1			STOVALL, Roy R	RM2	
	HENDRICKS, Edward C	RM2	CWO2 '59		STUART, Robert B	Rdo Engr	
SD5	HILDERBRAND, Henry L	CRM	Ltjg '50		TERHUNE, John A	Cdr	Cdr '47
	HIVELY, Jack	SC1		EM27	TERRY, Charles F	RM3	LCdr '60
	HORNBY, Albert E	RM2	CWO3 '59		THOMSON, J W M	S1	
	HUCKINS, Thomas A	Lt	Capt '54		THURMAN, A L	SC1	
	HURLEY, David C	CY		SD9	TODD, George B	CRM	Lt '52
	JARSON, Maurice M	CRM	Lt '49	AE3	TOWNSEND, Gordon E	RM2	LCdr '60
	KALMBACH, William W	RM1	LCdr '58		TUREGANO, Bernard W	RM2	CWO3 '57
	KEENAN, Gilbert F	RM2		W21	TWEED, George R	RM1	Lt '51
	KLEINSTEUBER, R W	SC2			IVANDEKAMP, Garrett	RM1	
22	KNUDSEN, Henry T	CRM	Lt '53		WAMBERG, M W USMC	Pvt	
	LaMORIE, C Joseph	RM2	RMC '53	21	WATSON, Ralph C	CRM	Lt '51
26	LASSETER, John M	RM1	Lt '57	31	WELCH, Joseph	RM1	
33	LASSWELL, Harold A	RM1	Lt '58		WELDIN, George C	Lt	Capt '46
				32	WILSON, George L Jr	RM1	LCdr '56

Deceased.

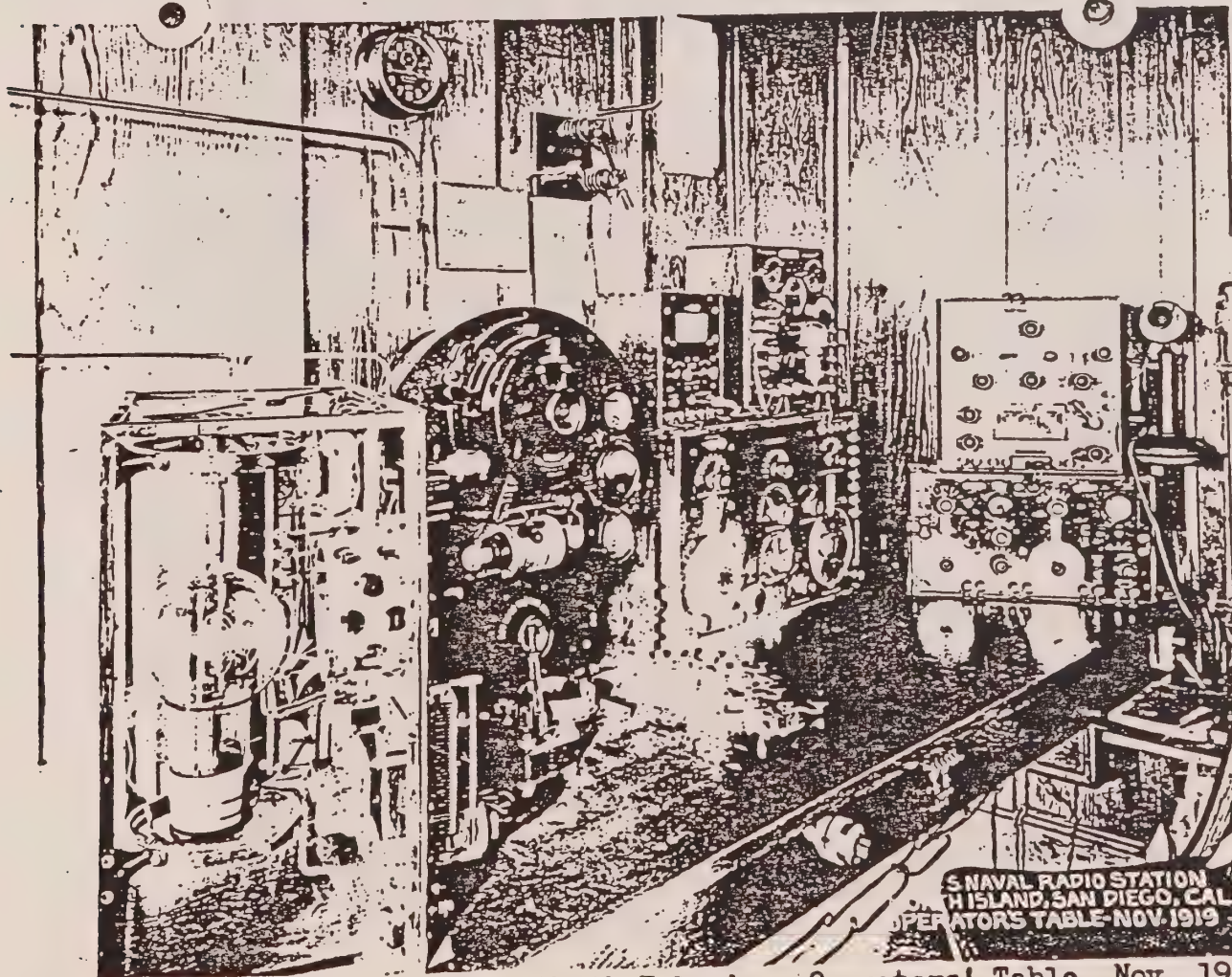
MEMBER OTC SoCal and/or NorCal
1984 or earlier.

ADDRESS on hand in 1984.

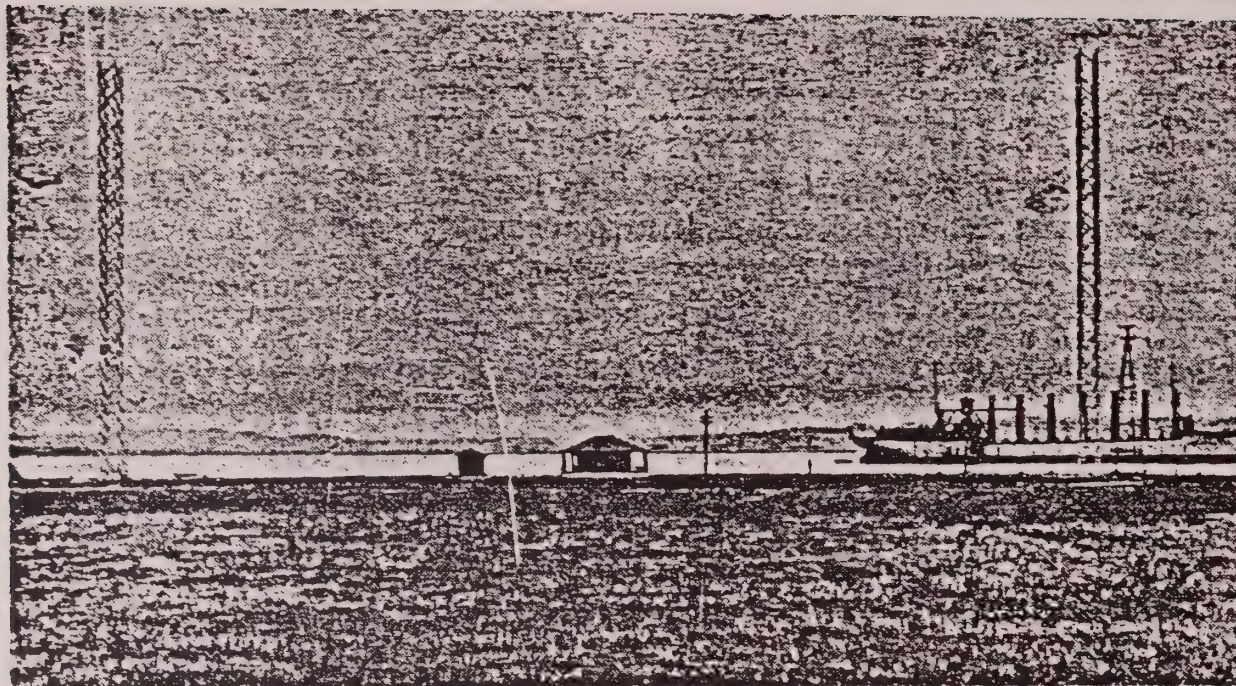
From copies in OTC archives of Xmas cards
belonging to Schweizer & Rippard. San Diego,
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Officers class numbers, if known, added for
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are those made during research.



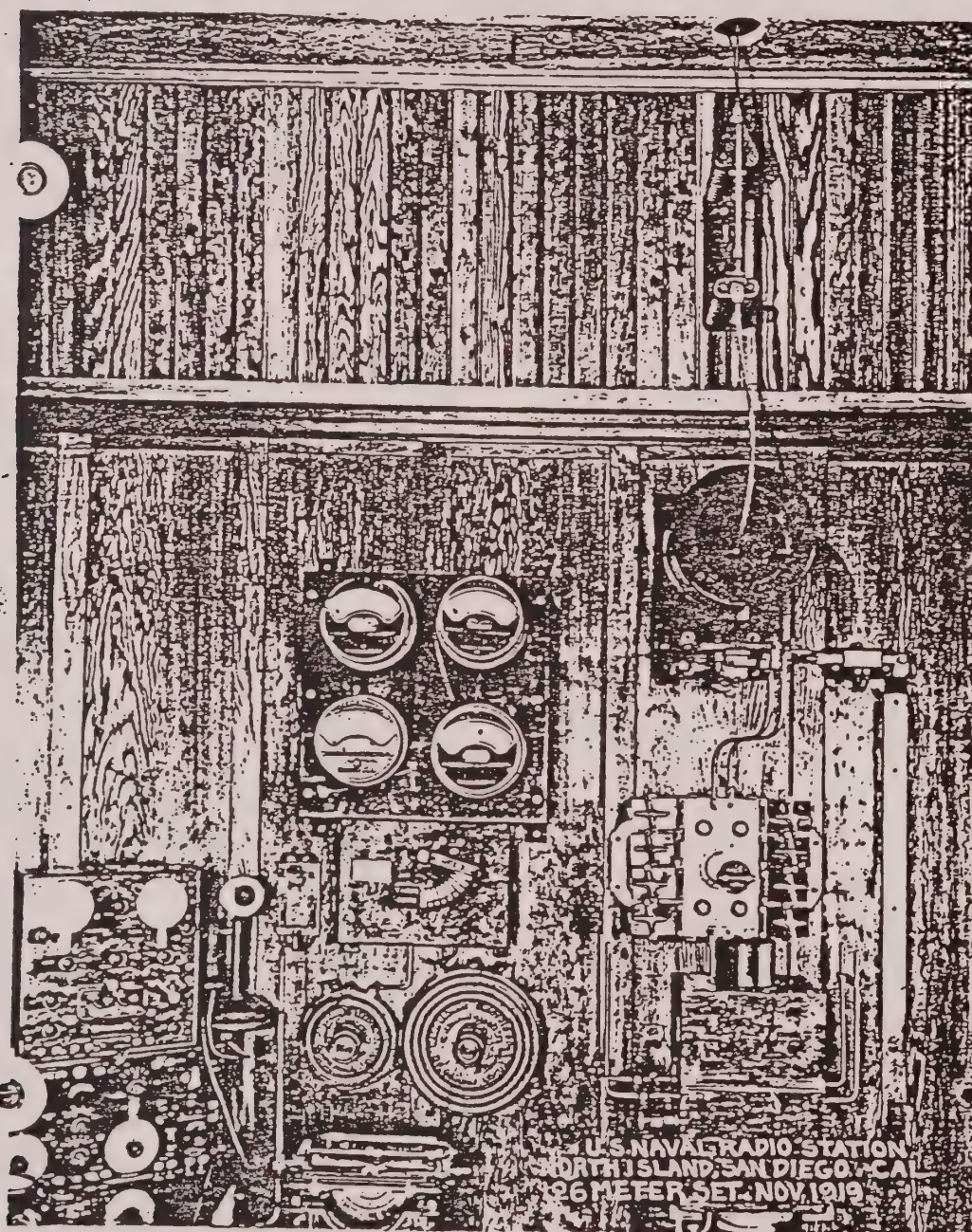
U. S. Naval Radio Station, North Island - Operating Building - 1919



U. S. Naval Radio Station, North Island - Operators' Table Nov. 1919



RECEIVER SITE at North Island during the World War I years. It was moved to North Island from Point Loma in 1918.



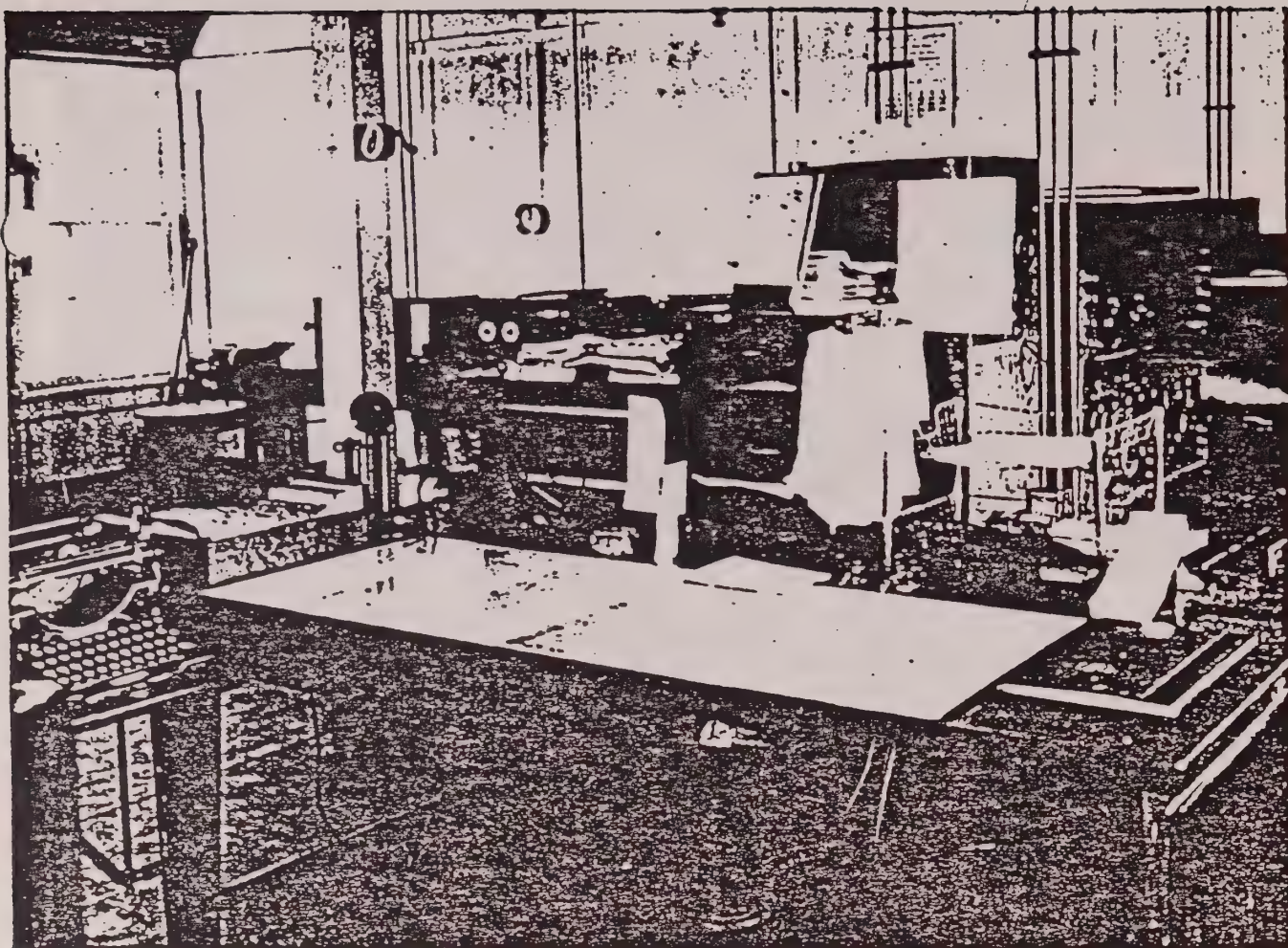
U. S. Naval Radio Station, North Island, 126 meter set



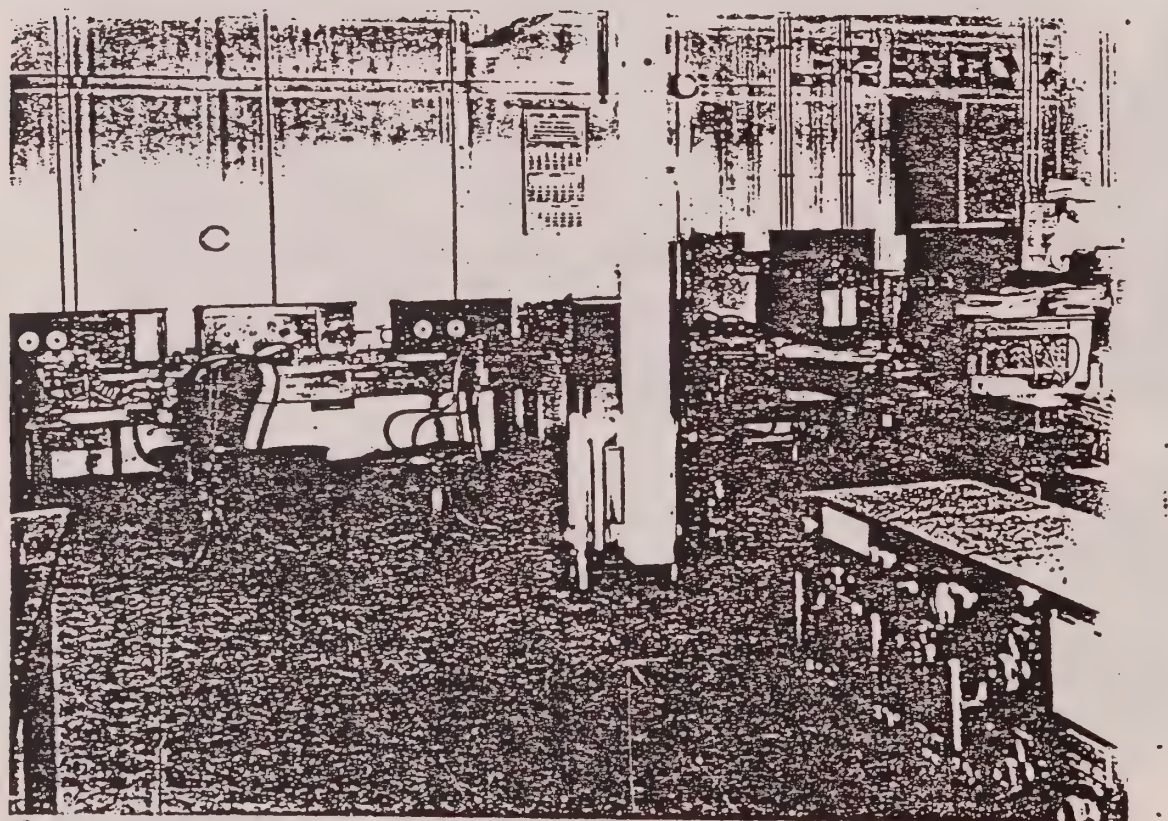
U. S. Naval Radio Station, Point Loma - view south - May 1920



Navy Point Loma Radio Control Station 1927 1927

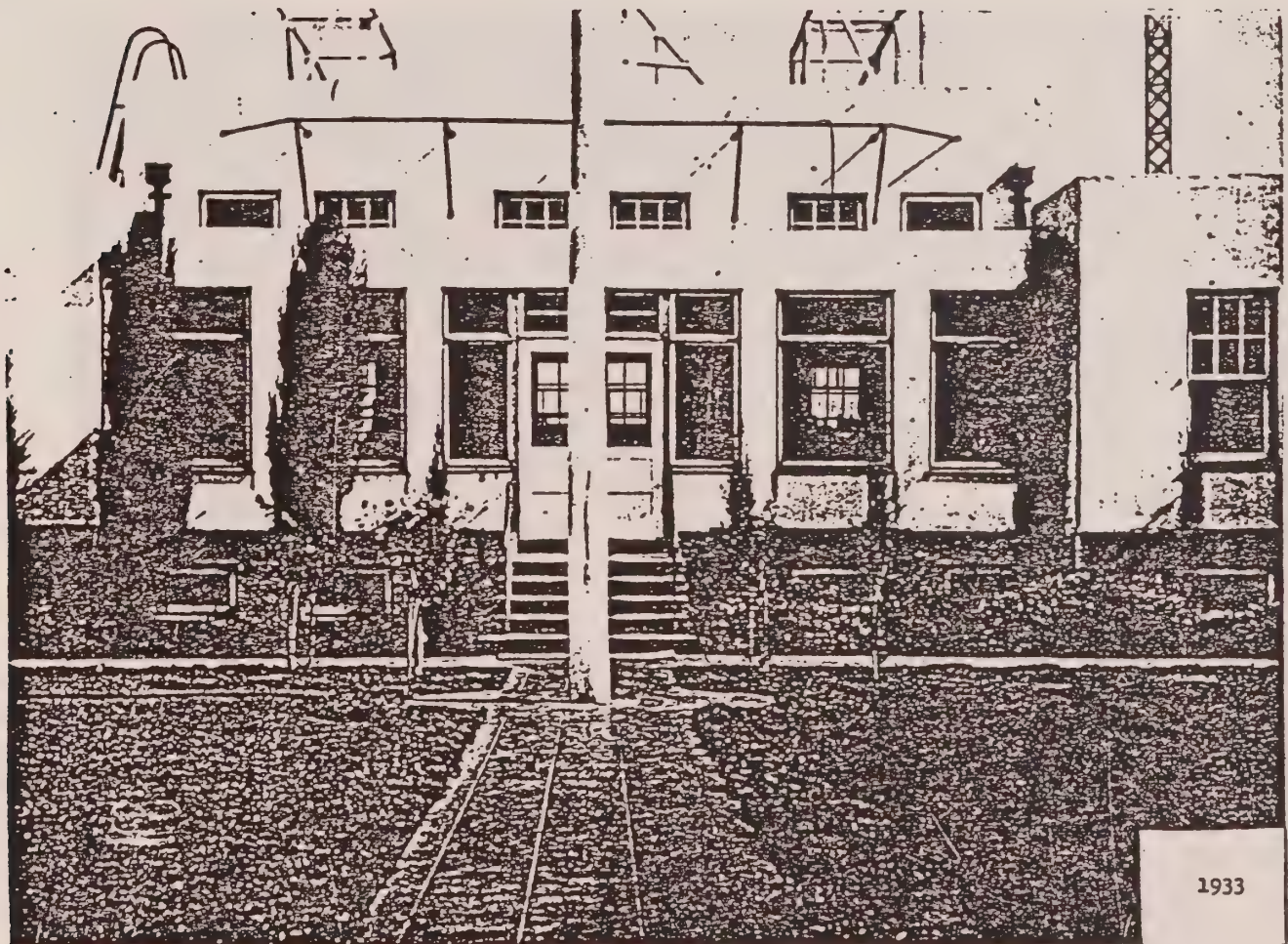
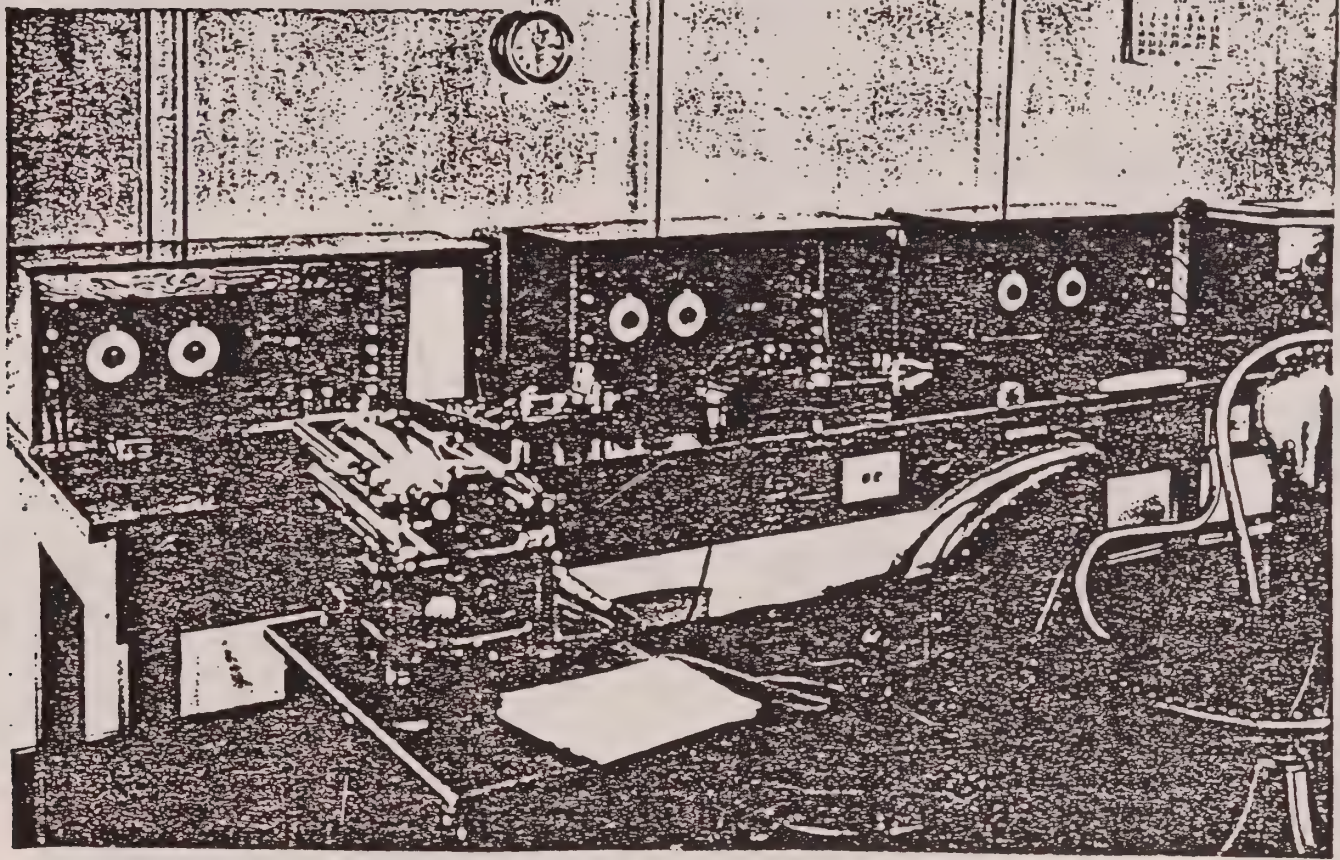


Traffic Chief's Desk - Naval Radio Station, Point Loma - 1927

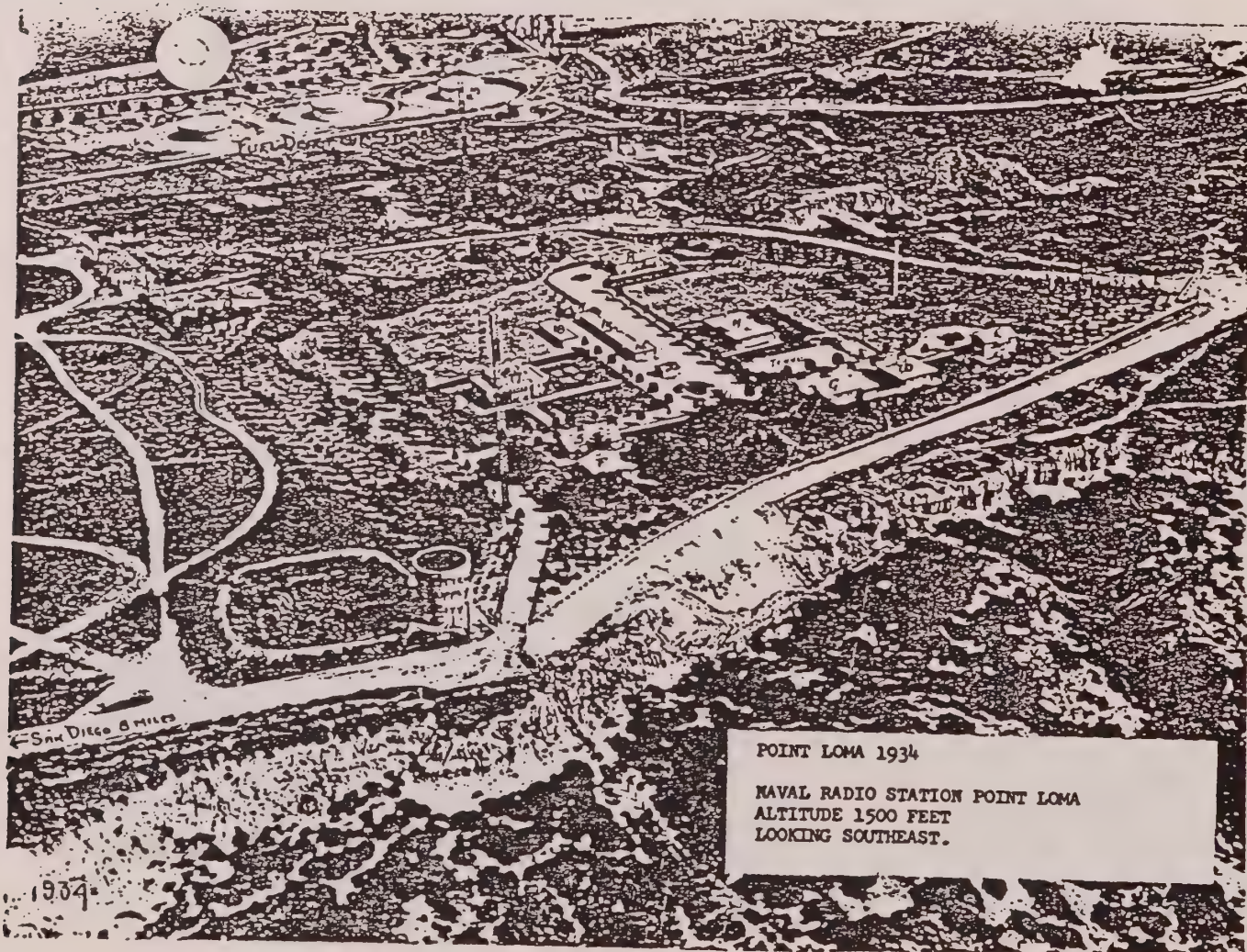


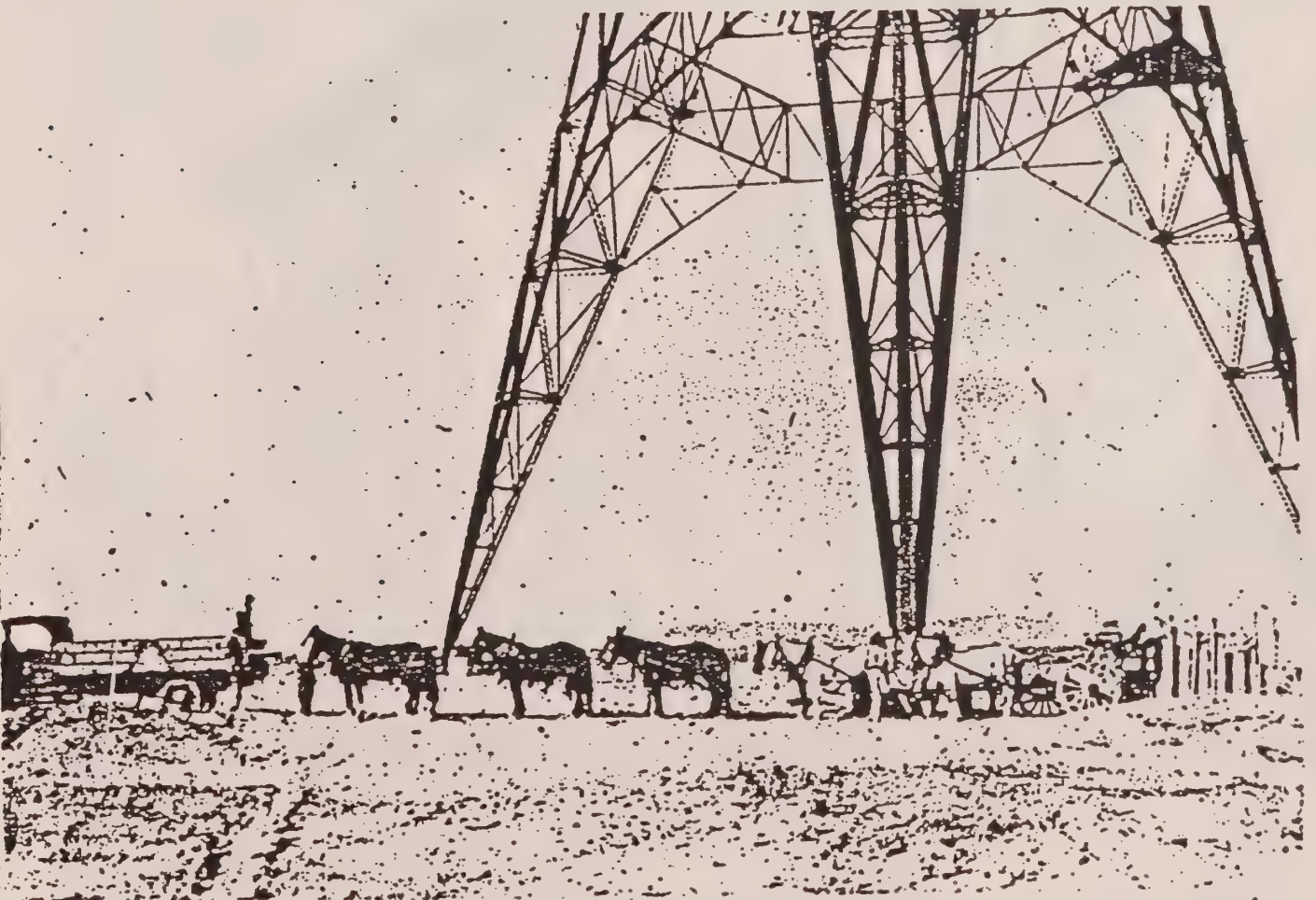
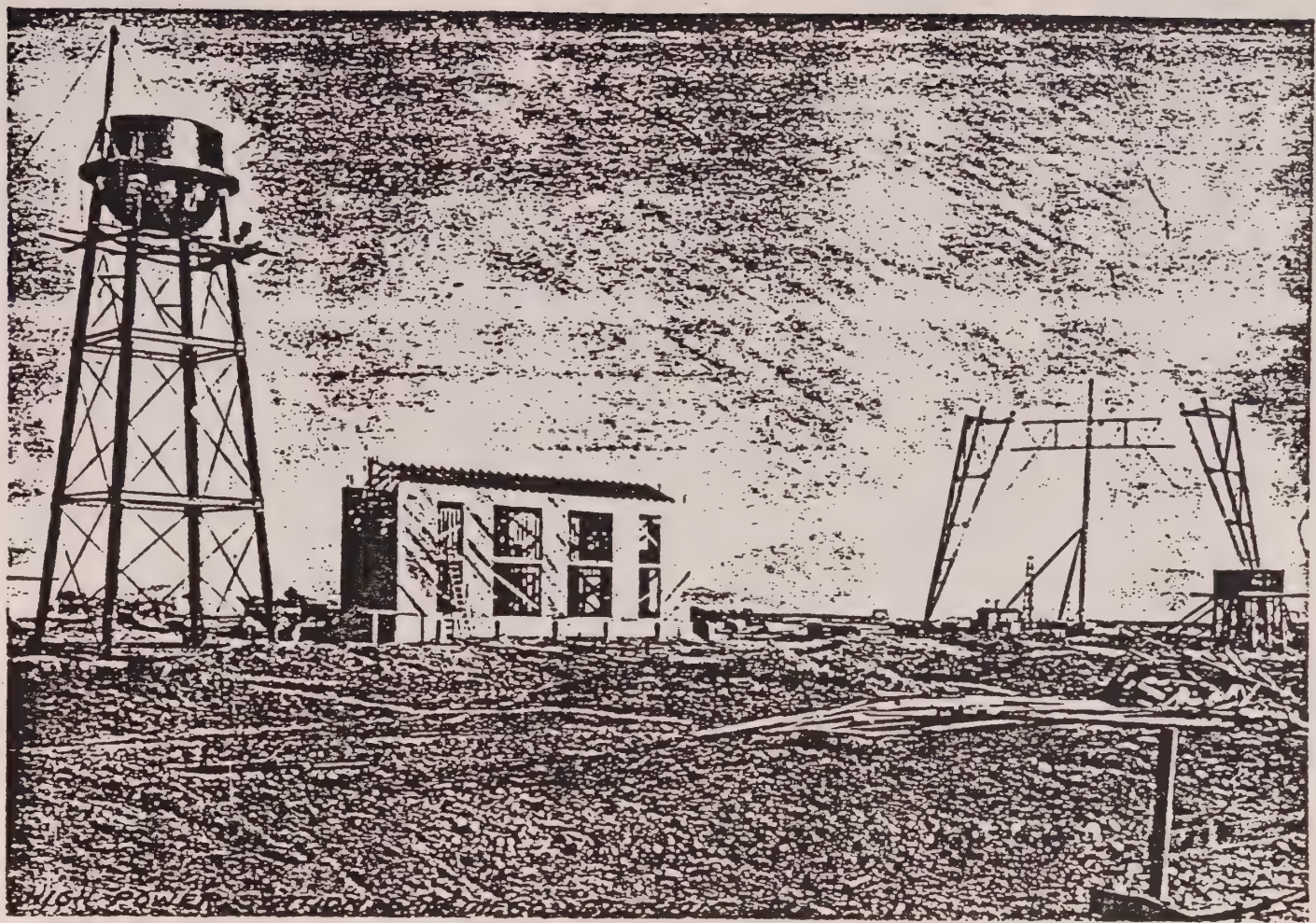
Operating room - Navy Radio Station Point Loma - 1927

RADIO OPERATING POSITIONS AT
NAVAL RADIO STATION POINT LOMA
1927

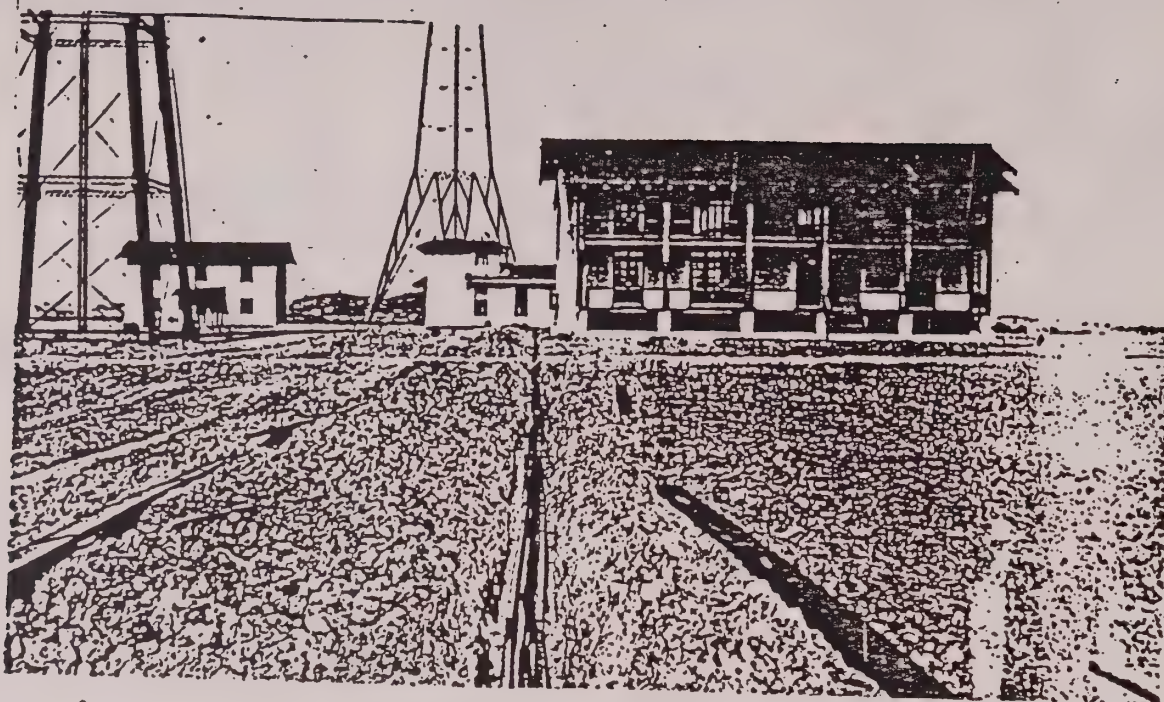


Front view - Navy Radio Station, Point Loma - 1933





Chollas Heights Radio Transmitting Station, under construction 1916

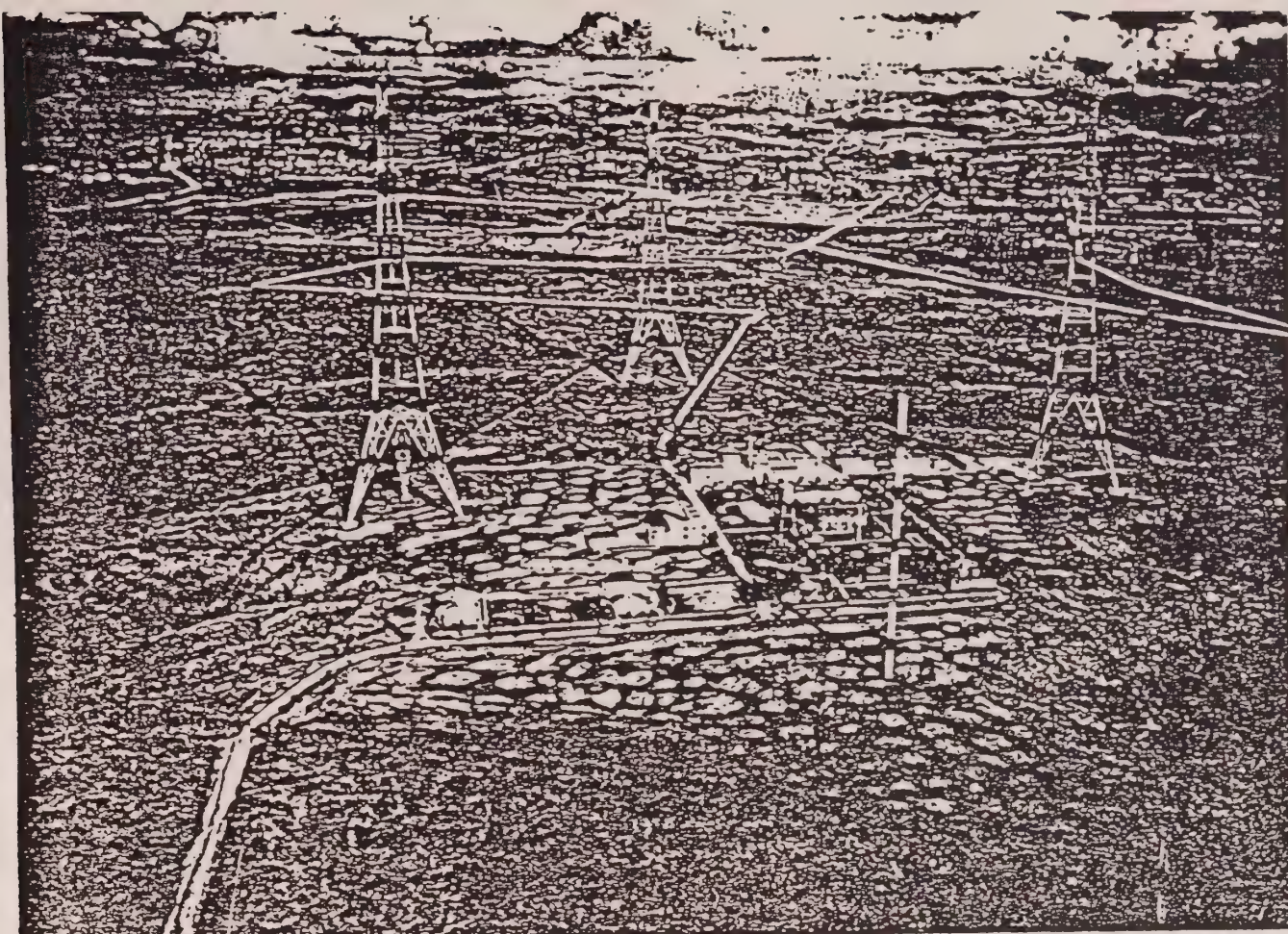


Chollas Heights - Single Men's Barracks - 1 March 1916

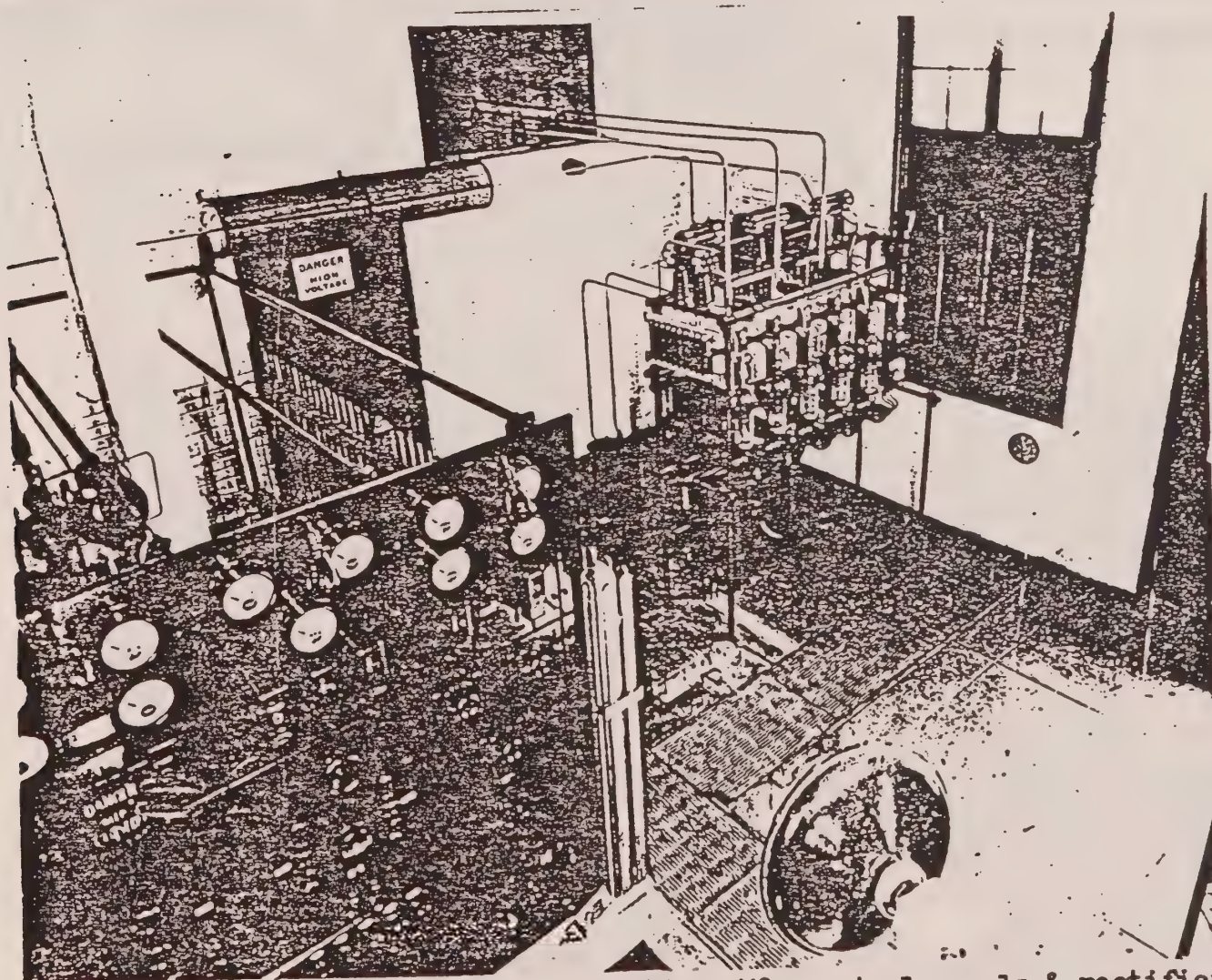


Nav. Radio Sta., Chollas Heights, San Diego, Cal. Jul. 9, 1924.
Office, Bldg. 2, looking north.

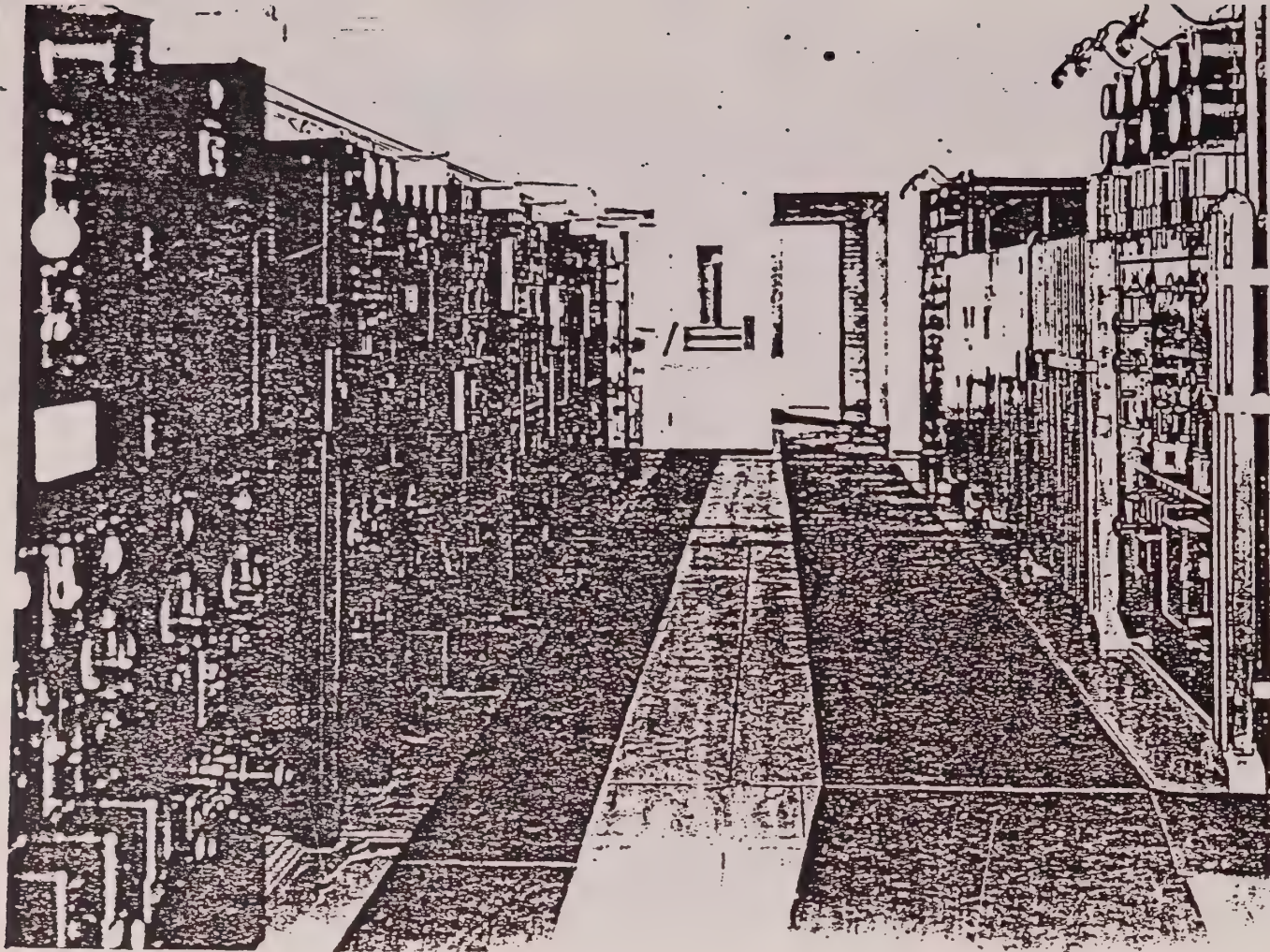
553



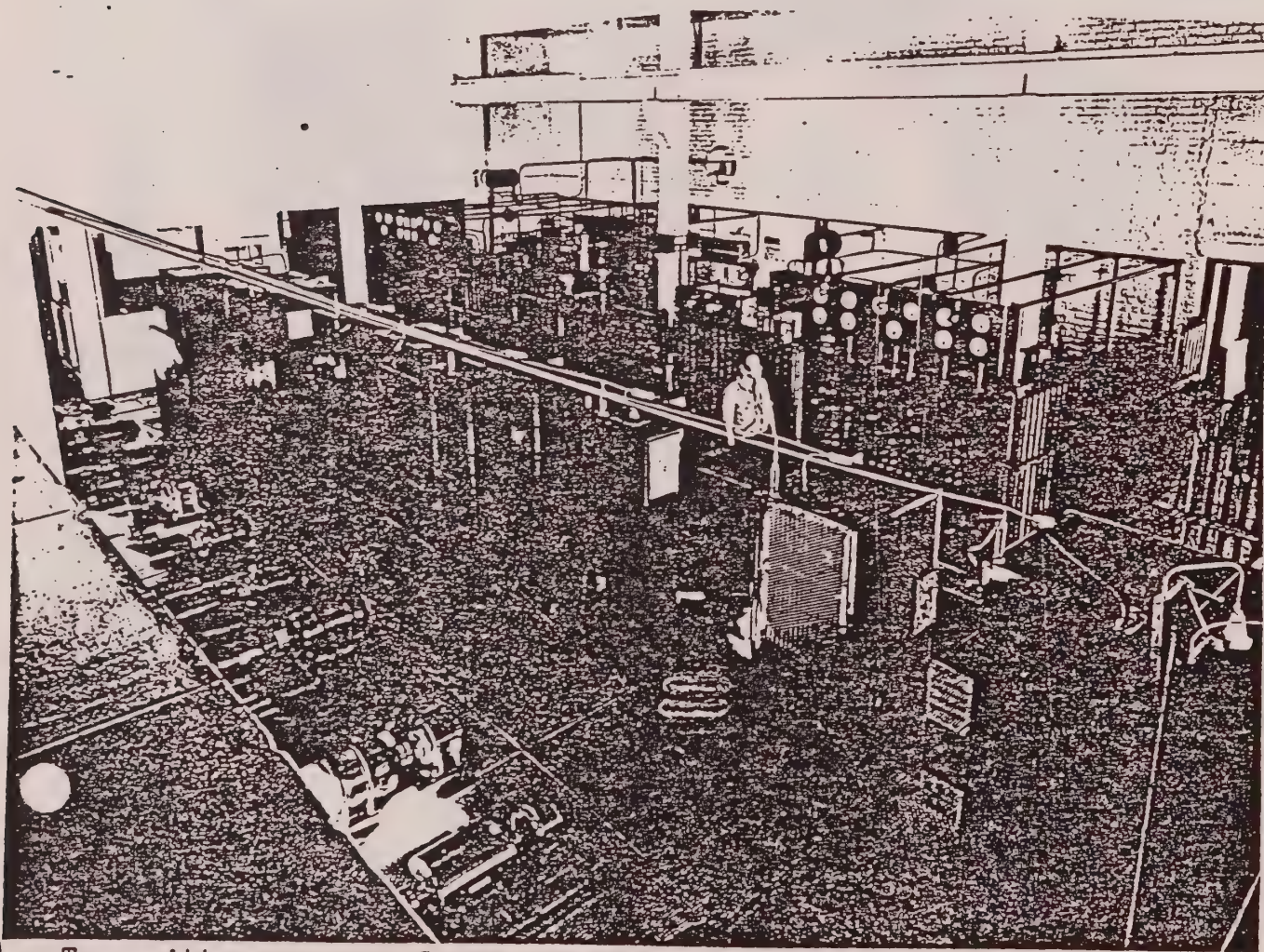
Navy Radio Station Chollas Heights - from 600 feet - looking east 1935



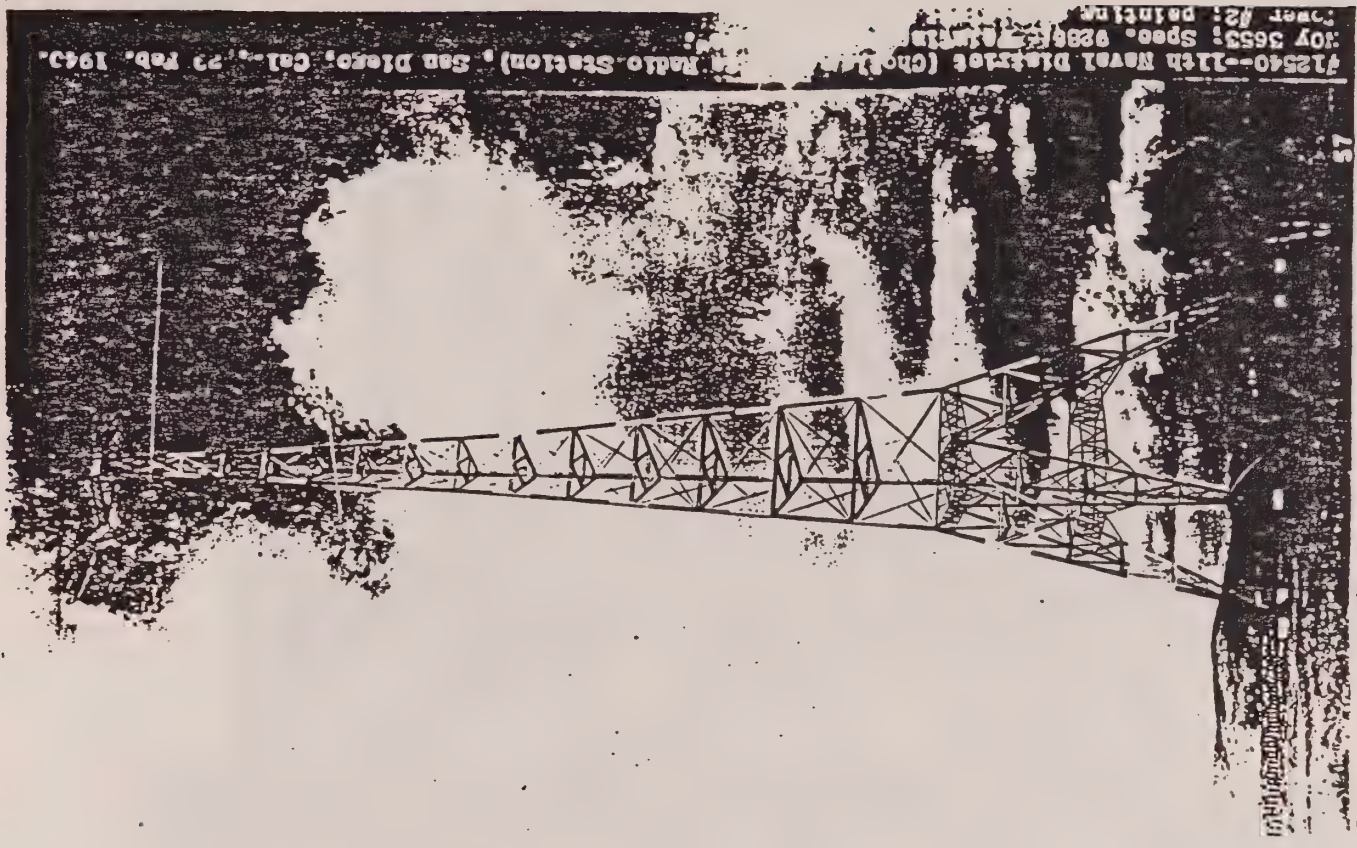
80/100 KW transmitter - Chollas Heights. M0, control panels & rectifier.



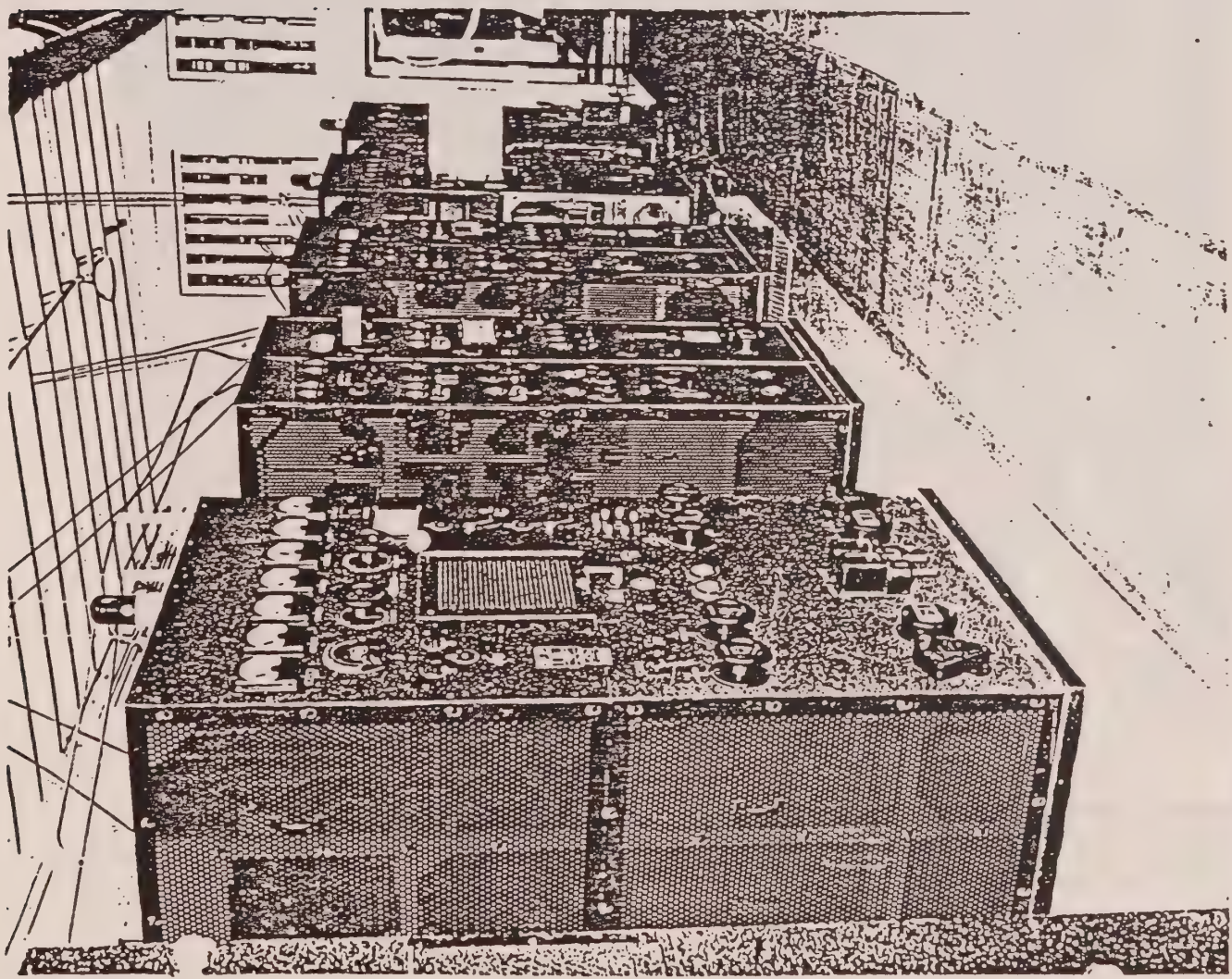
Radio transmitters - Naval Radio Station, Chollas Heights, November 1939
 Transmitter tags read: 215, 2716, 8150, 4010, 3615, 113 and 355.



Transmitter room - Chollas Heights Radio Station - November 1939

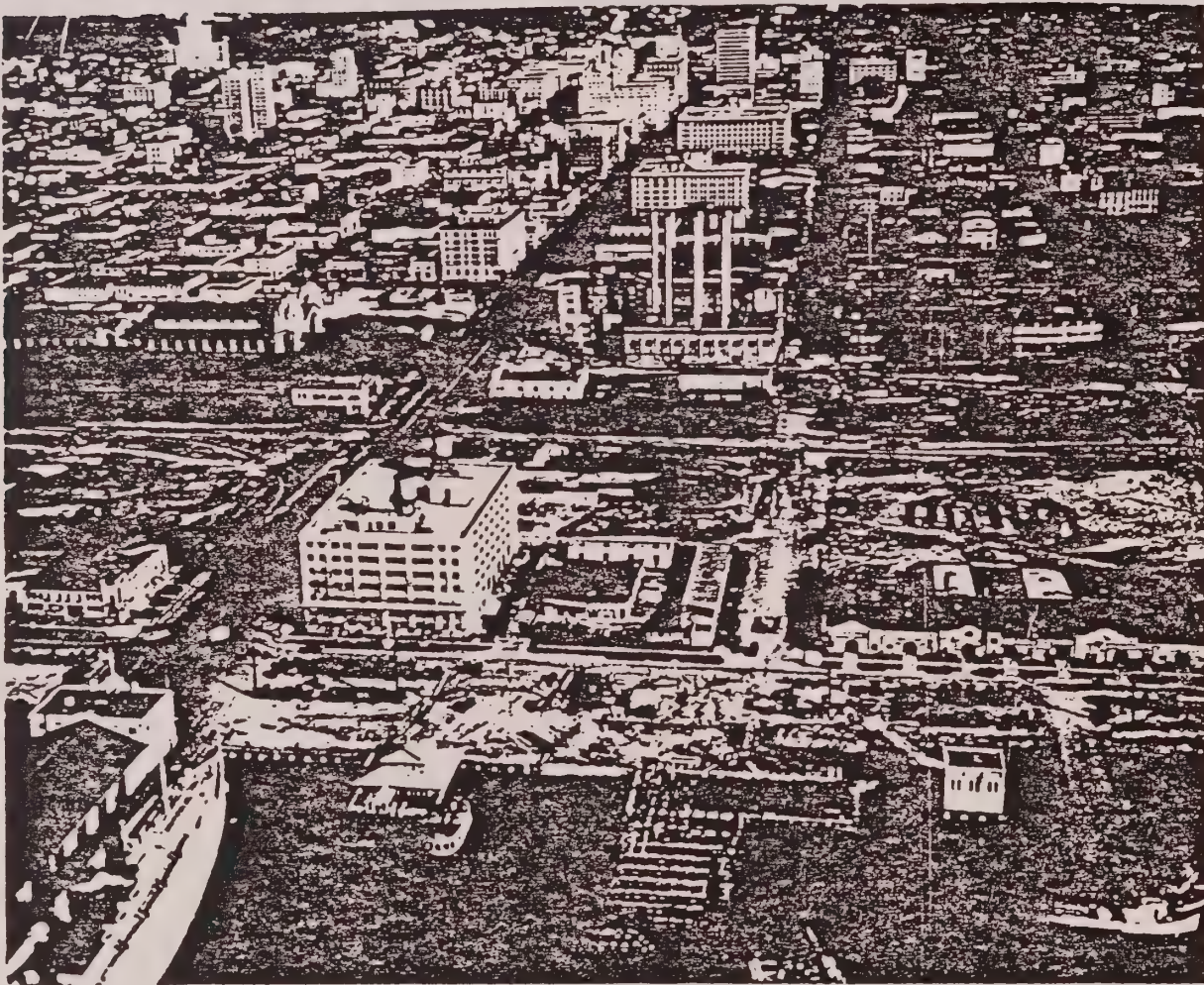


One of three 600 foot steel towers - Chollas Heights

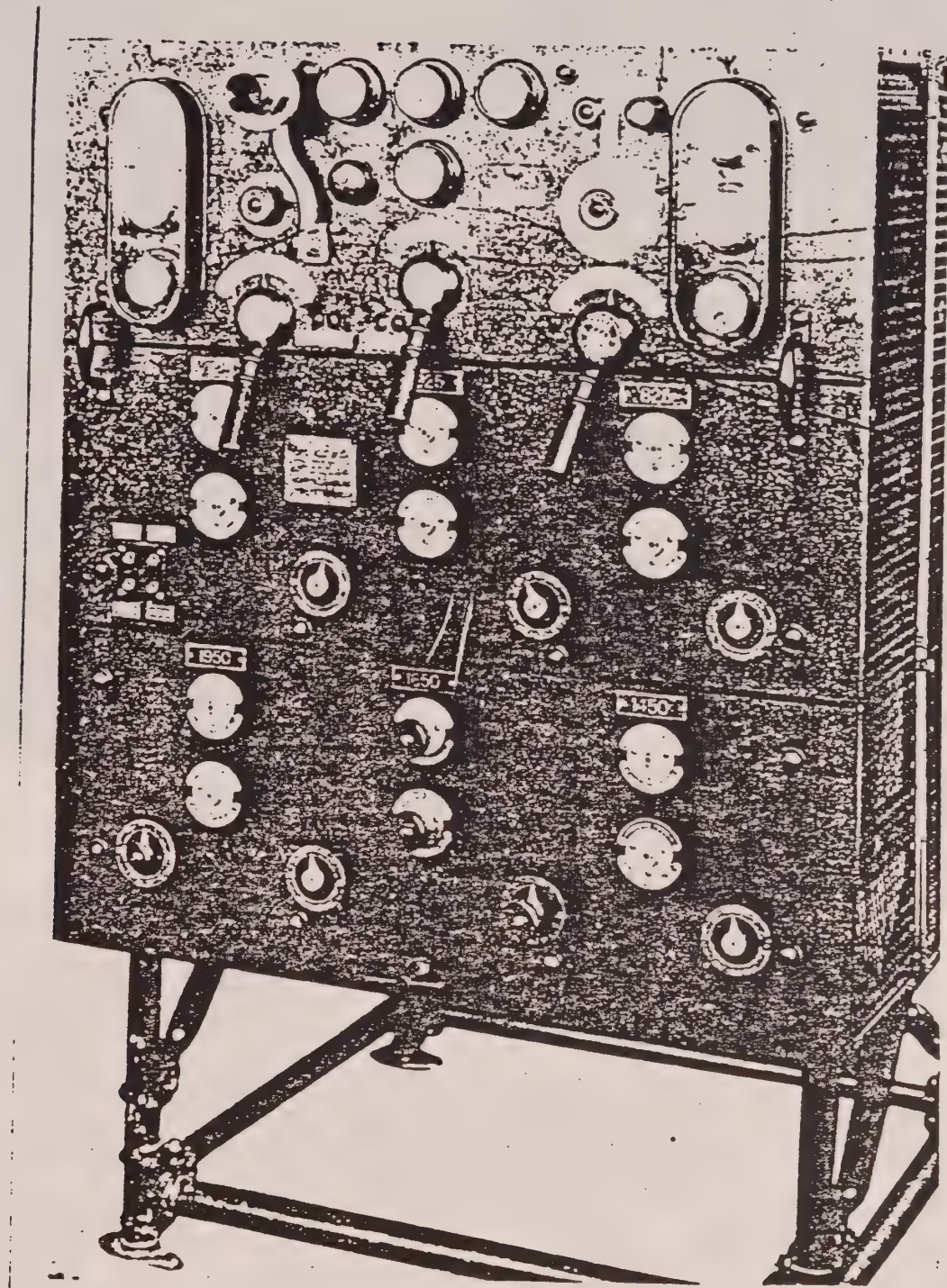


Transmitters - Chollas Heights - 1944

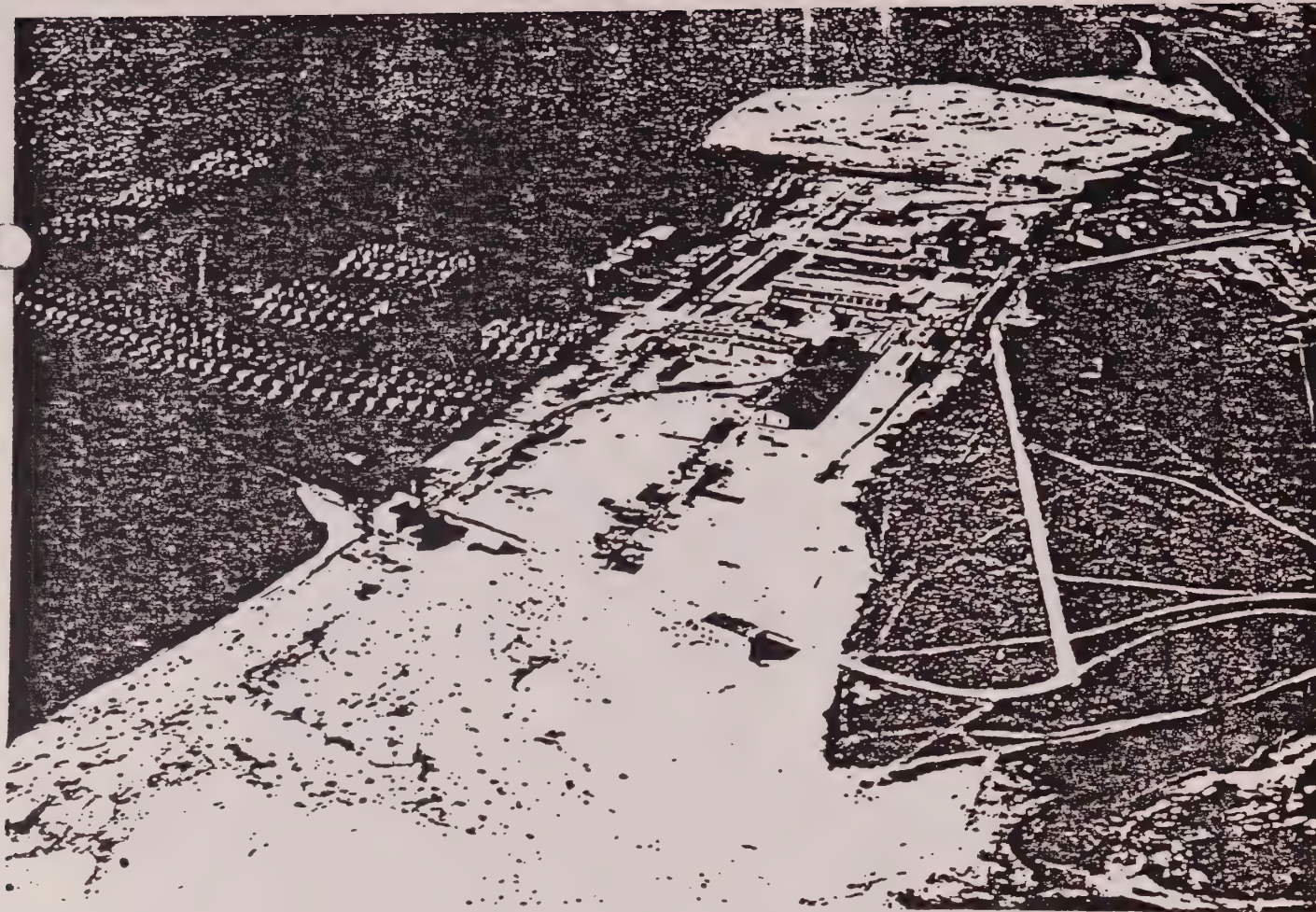
Foot of Broadway, S.D., Aug., '24



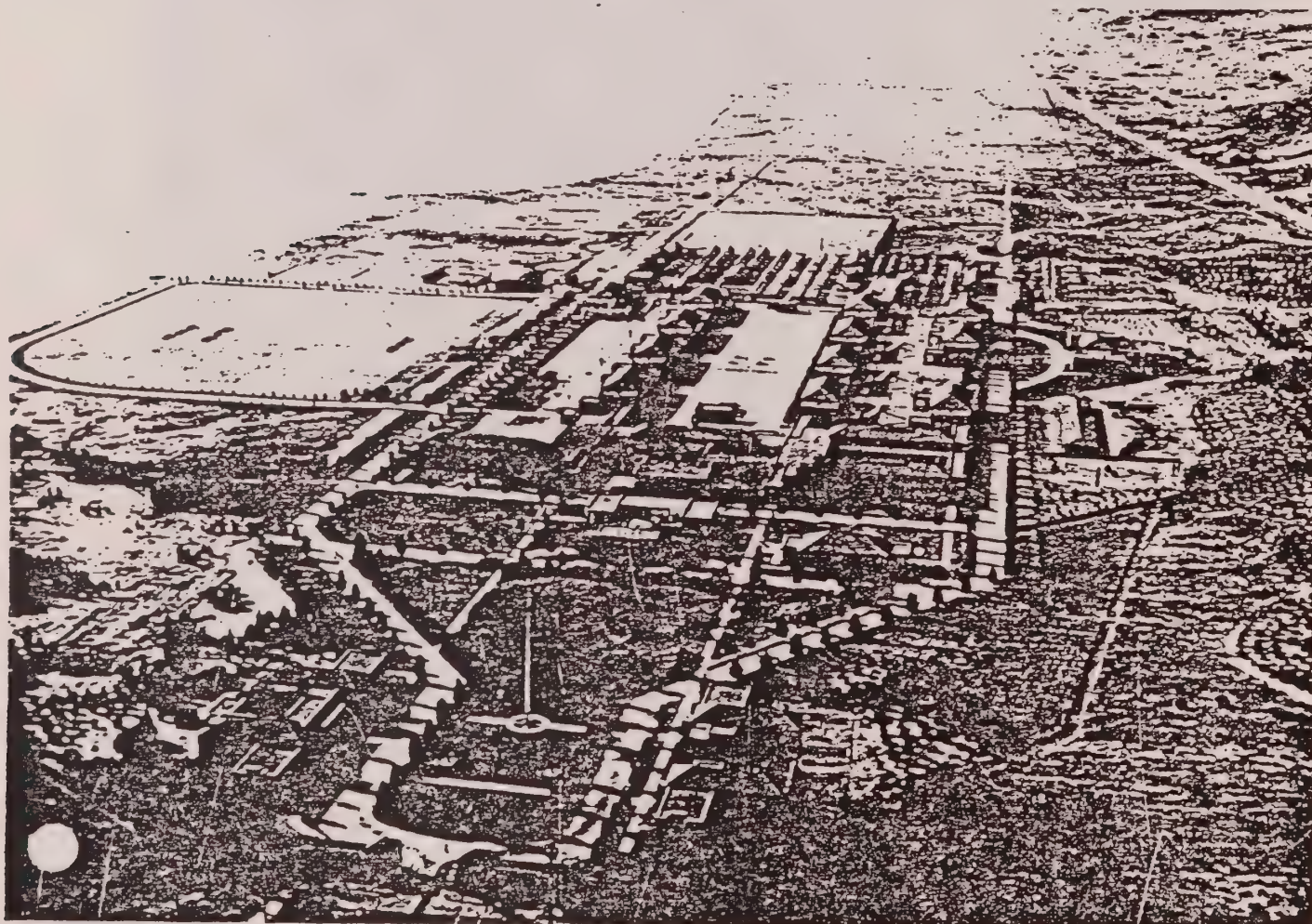
Eleventh Naval District Headquarters Building at the Foot of Broadway, San Diego in 1928. Kettner Powerhouse and Santa Fe Depot in background. SS Yale at the Broadway pier.



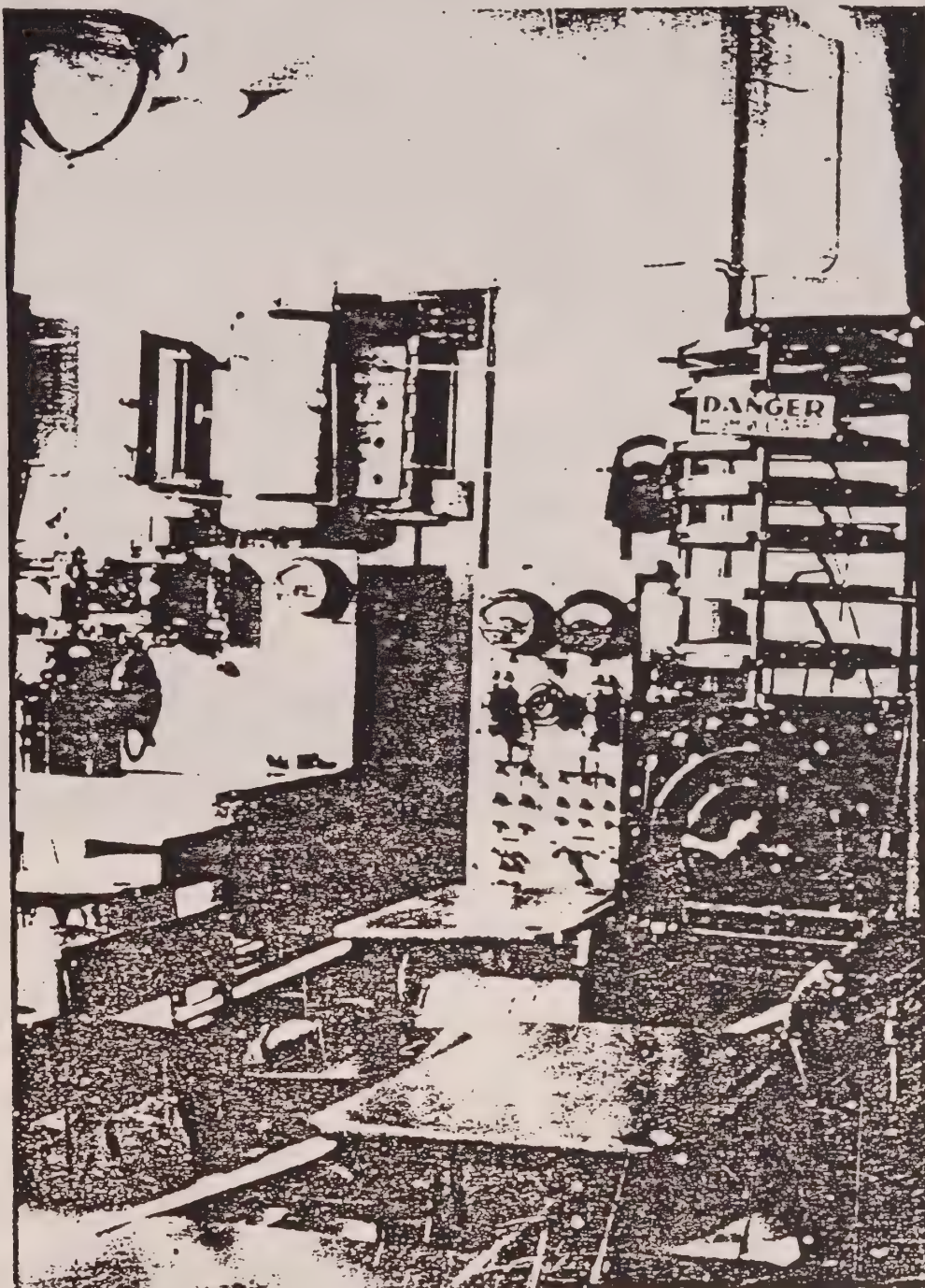
Navy Model "TA" Transmitter at NPL, foot of Broadway, 1923. Antenna was a 6 strand flat-top between Navy Headquarters building and the stacks on the Kettner Powerhouse. The transmitter nameplate stated it had been built by Westinghouse for the Venezuela Government - but it was bought by the Navy as the first vacuum tube transmitter - the "TA."



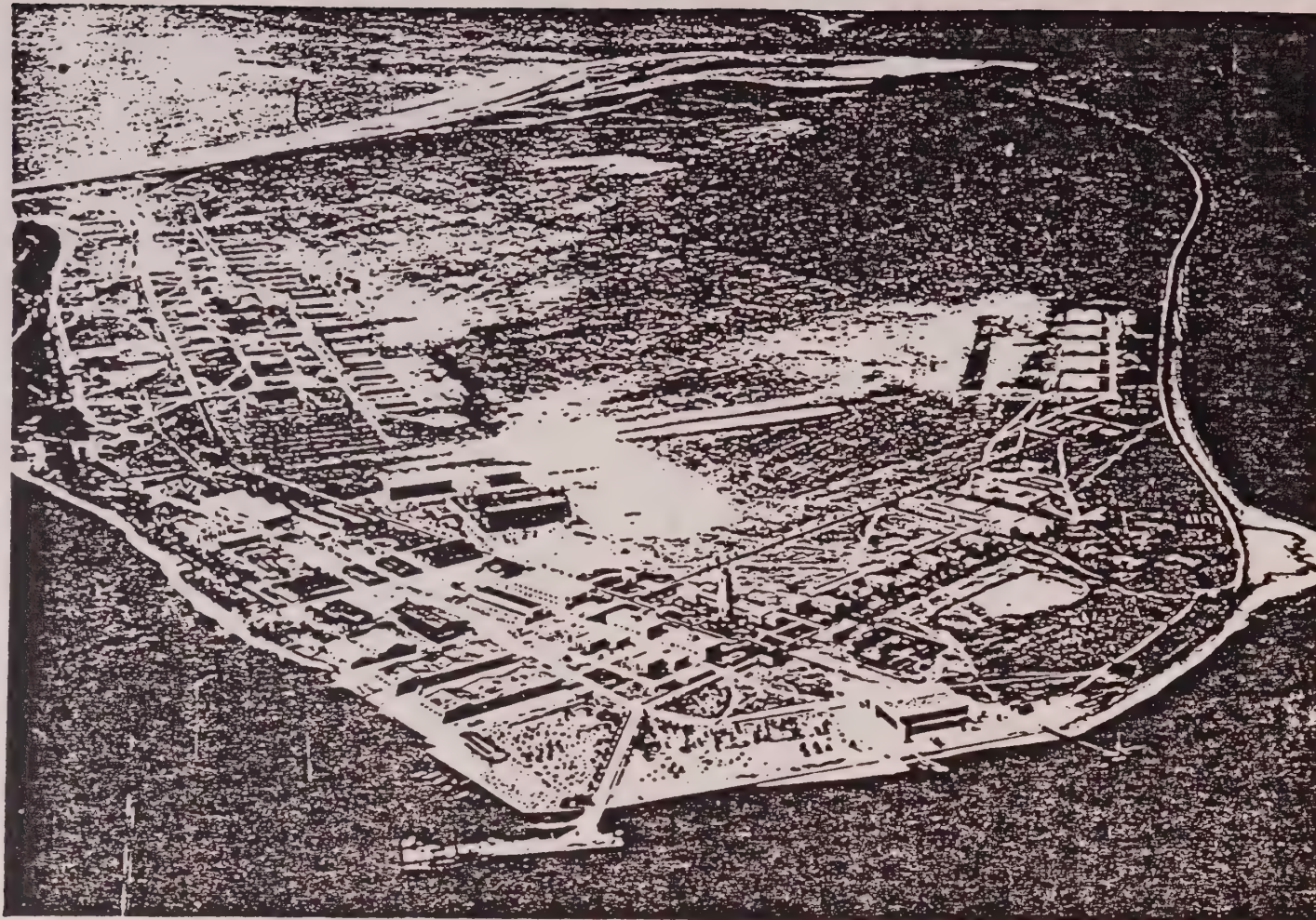
USS RIGEL and WWI destroyers at Destroyer Base, San Diego, 1928.



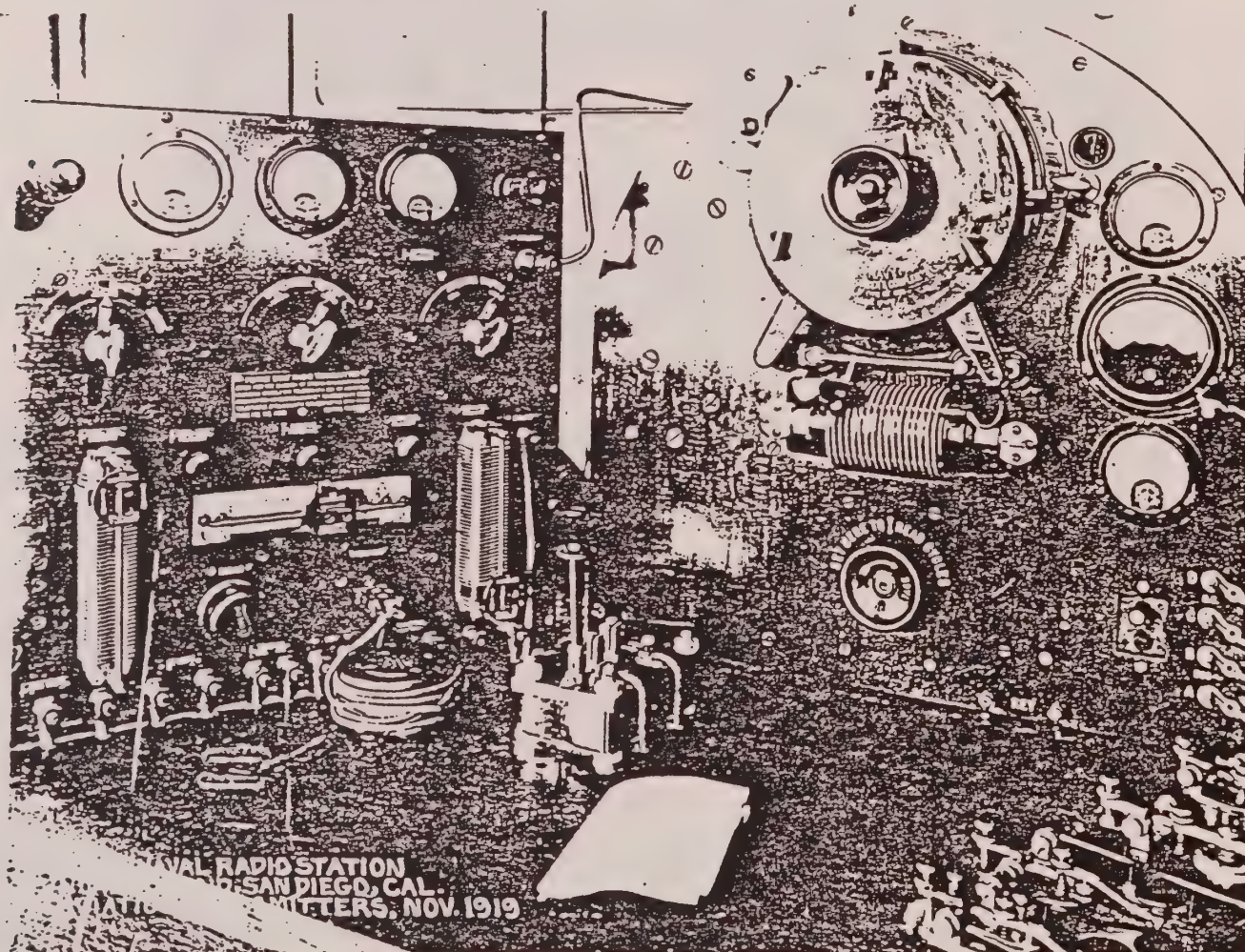
Naval Training Station, San Diego, 1928.



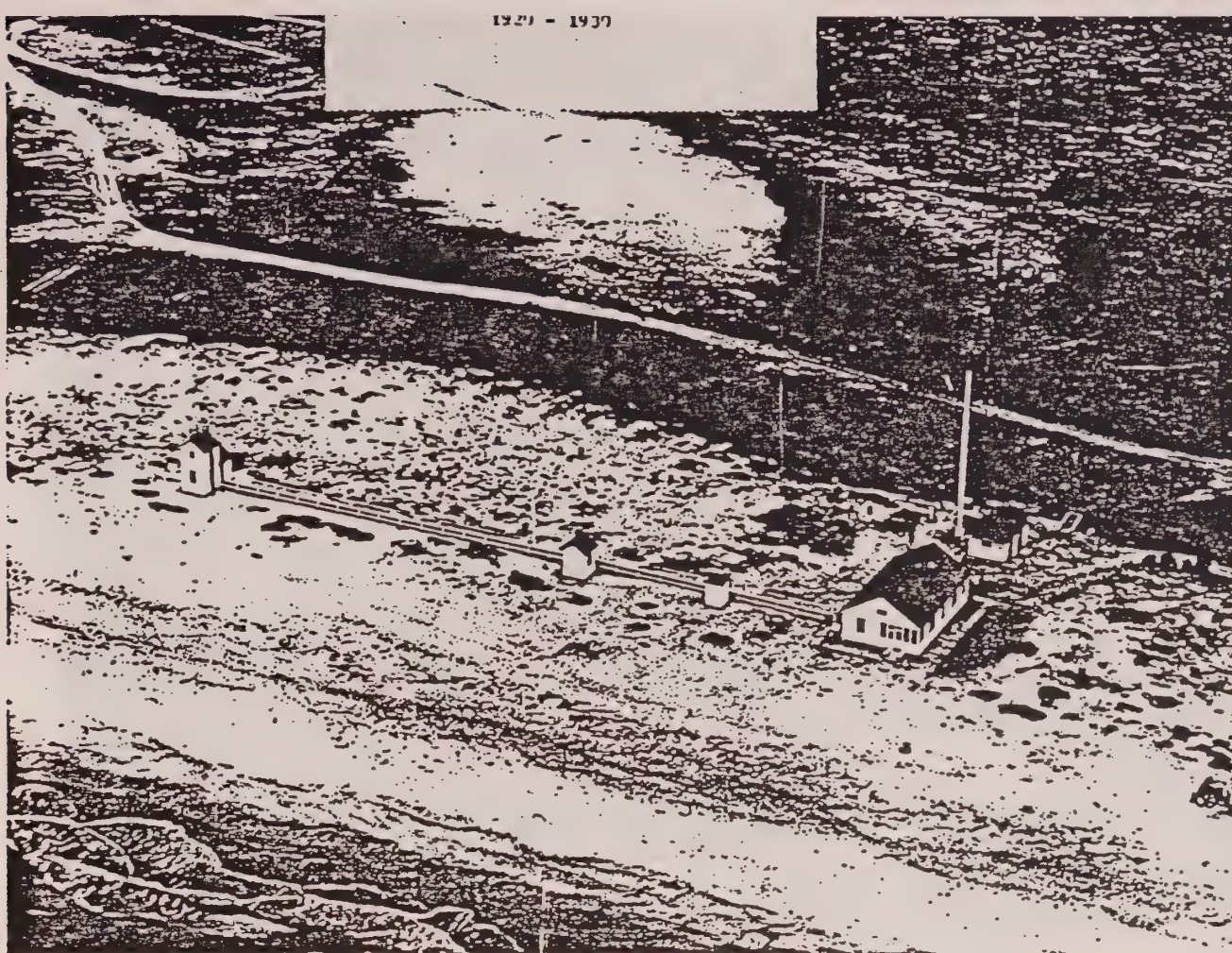
Class Room - Radio School
Naval Training Station,
San Diego - 1923?



U. S. Naval Air Station, North Island, 1928, before dredging doubled its size.



U. S. Naval Radio Station, North Island, November 1919.
Aviation transmitters: Type SE 1100 on left; Type CE 615A on right.

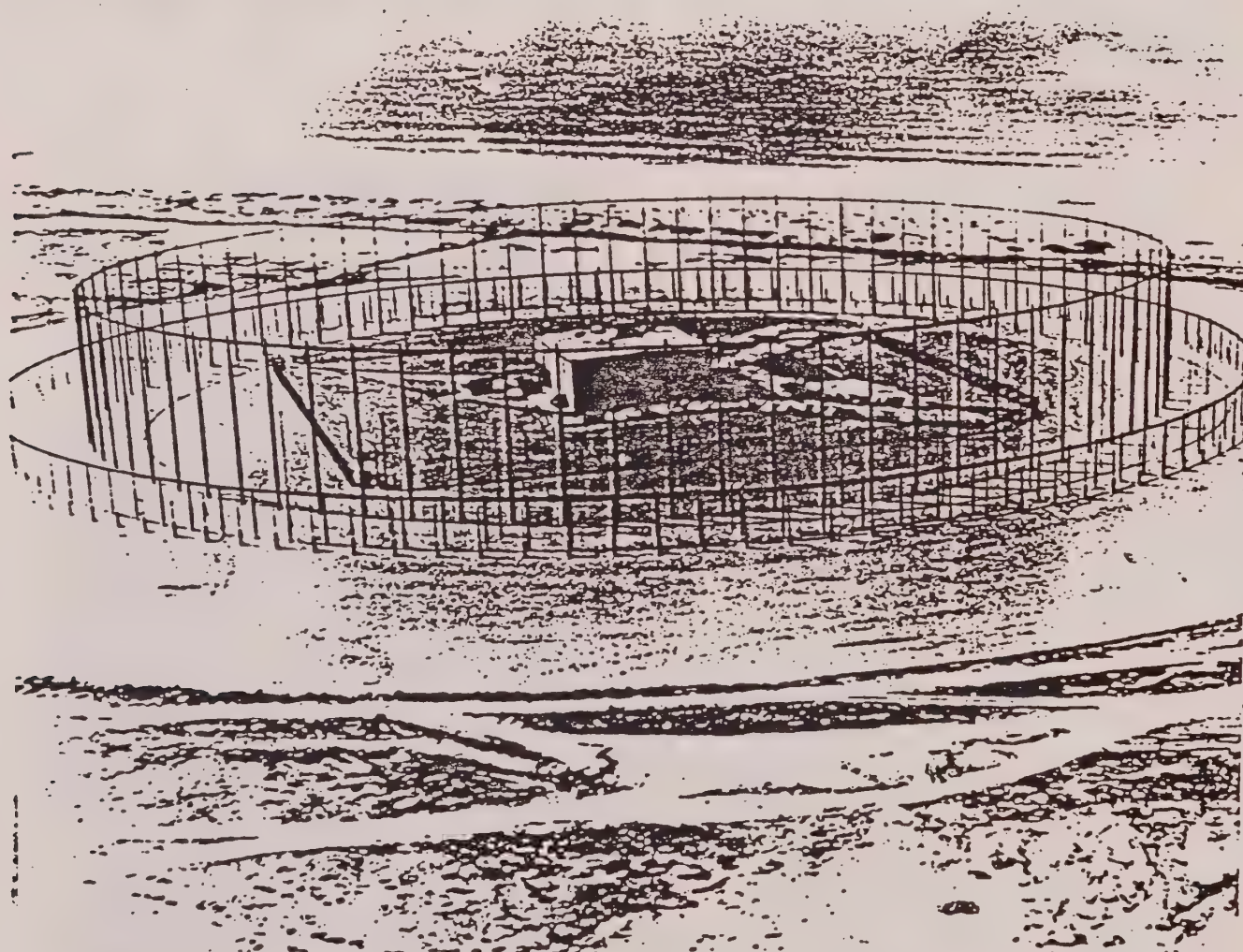
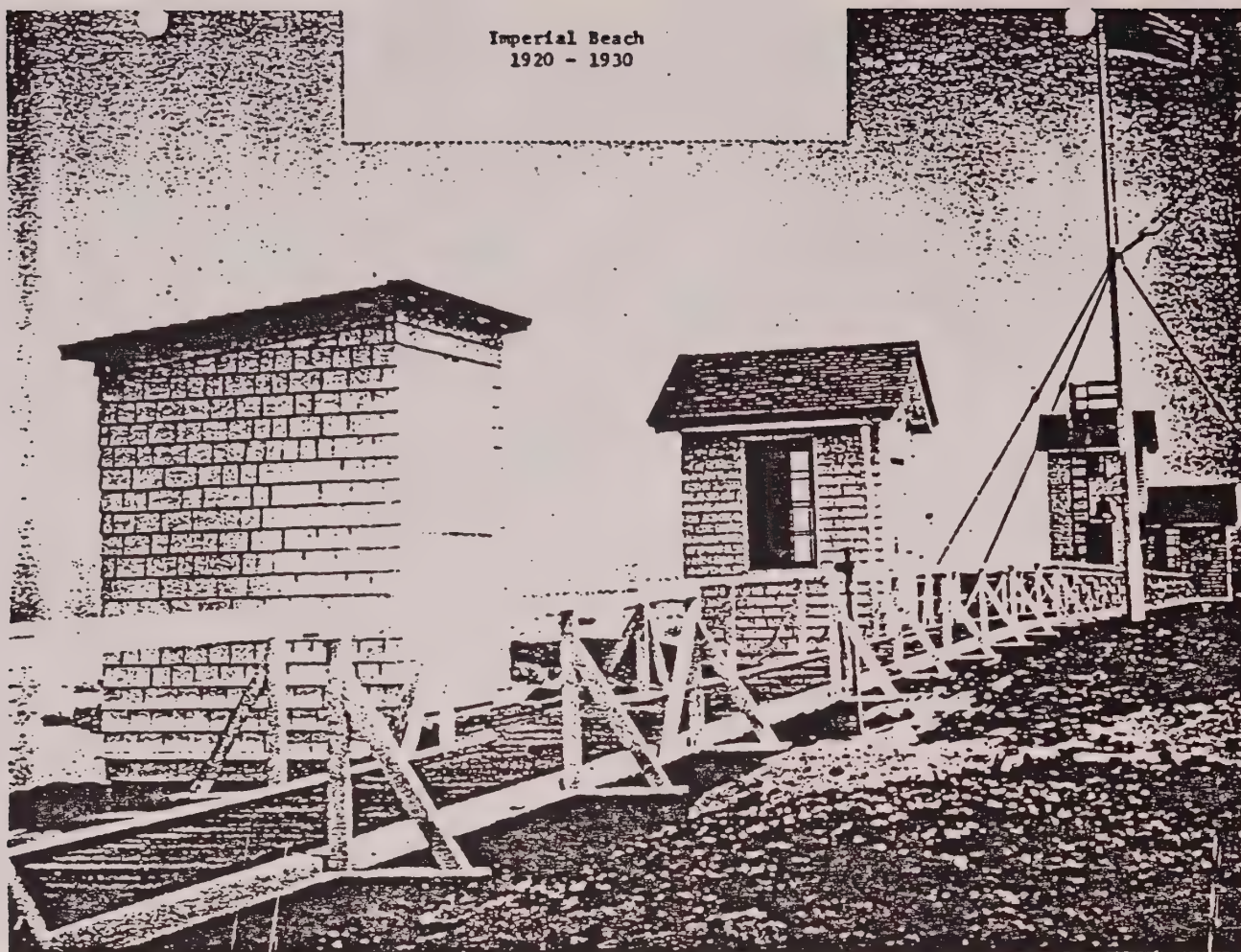


- 1 - COMPASS HOUSE
- 2 - RINC GARAGE
- 3 - POWER HOUSE
- 4 - RINC QUARTERS
- 5 - FIRE ENGINE HOUSE
- 6 - DORMITORY

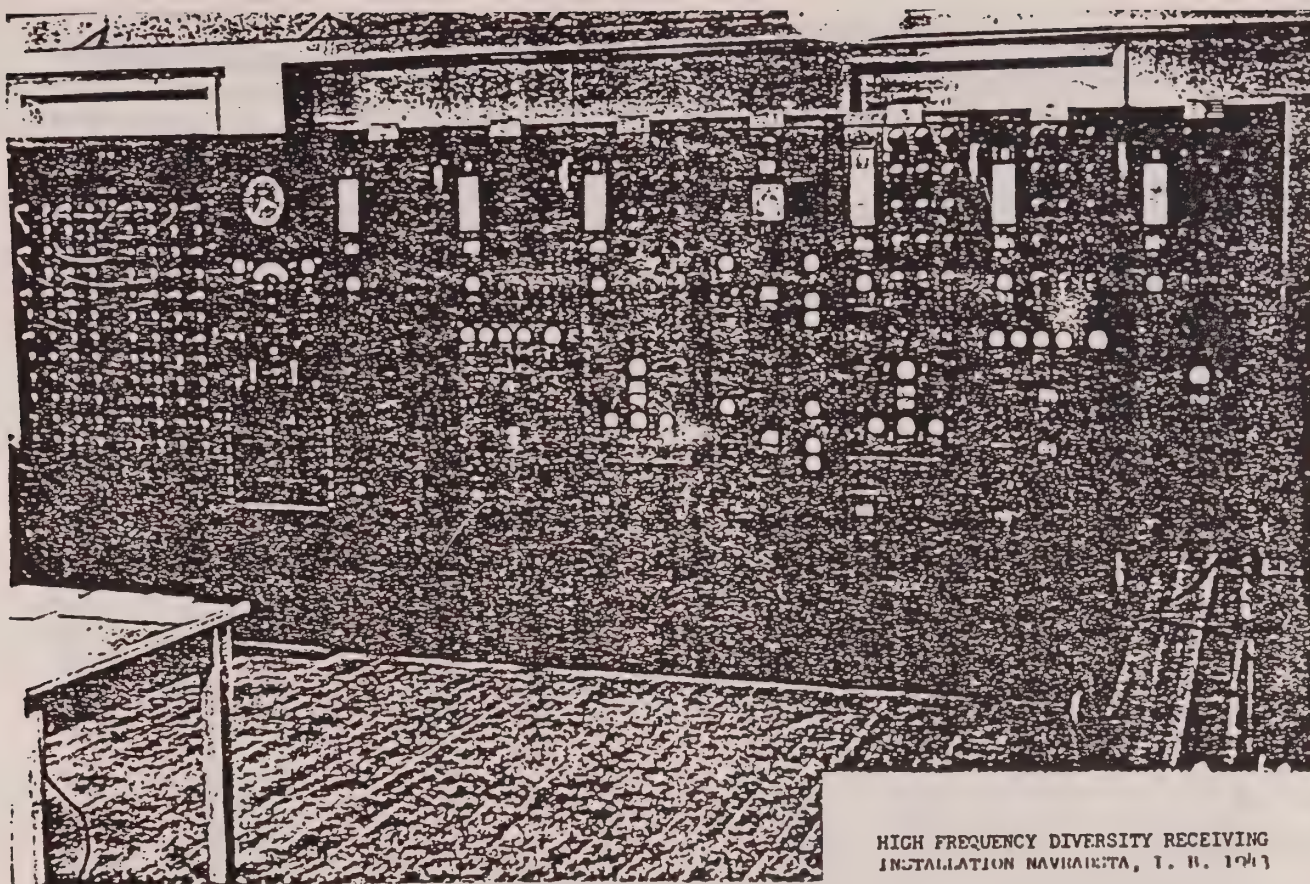
Imperial Beach
1929 - 1930



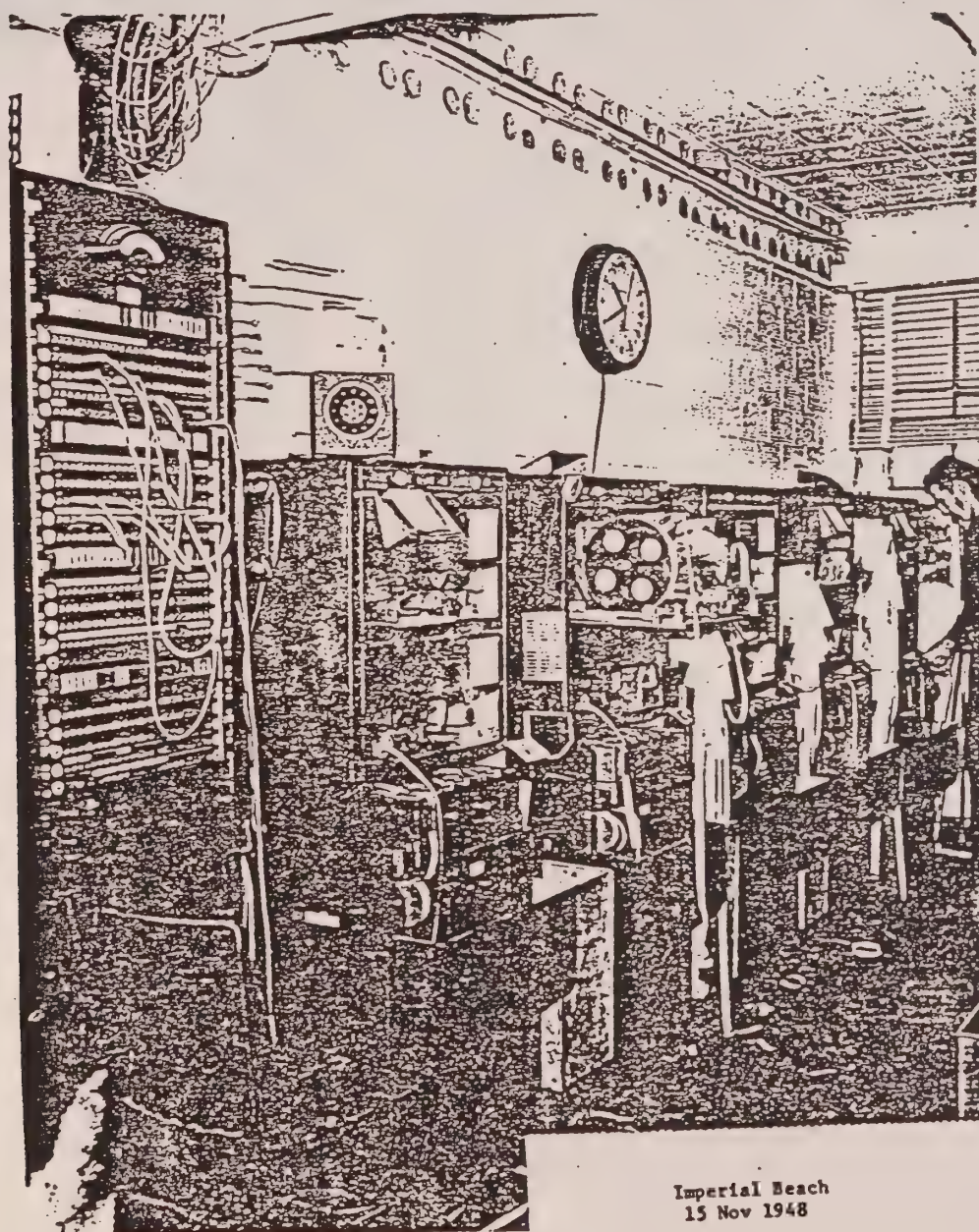
VIEW FROM TOP OF WATER TANK LOOKING WEST



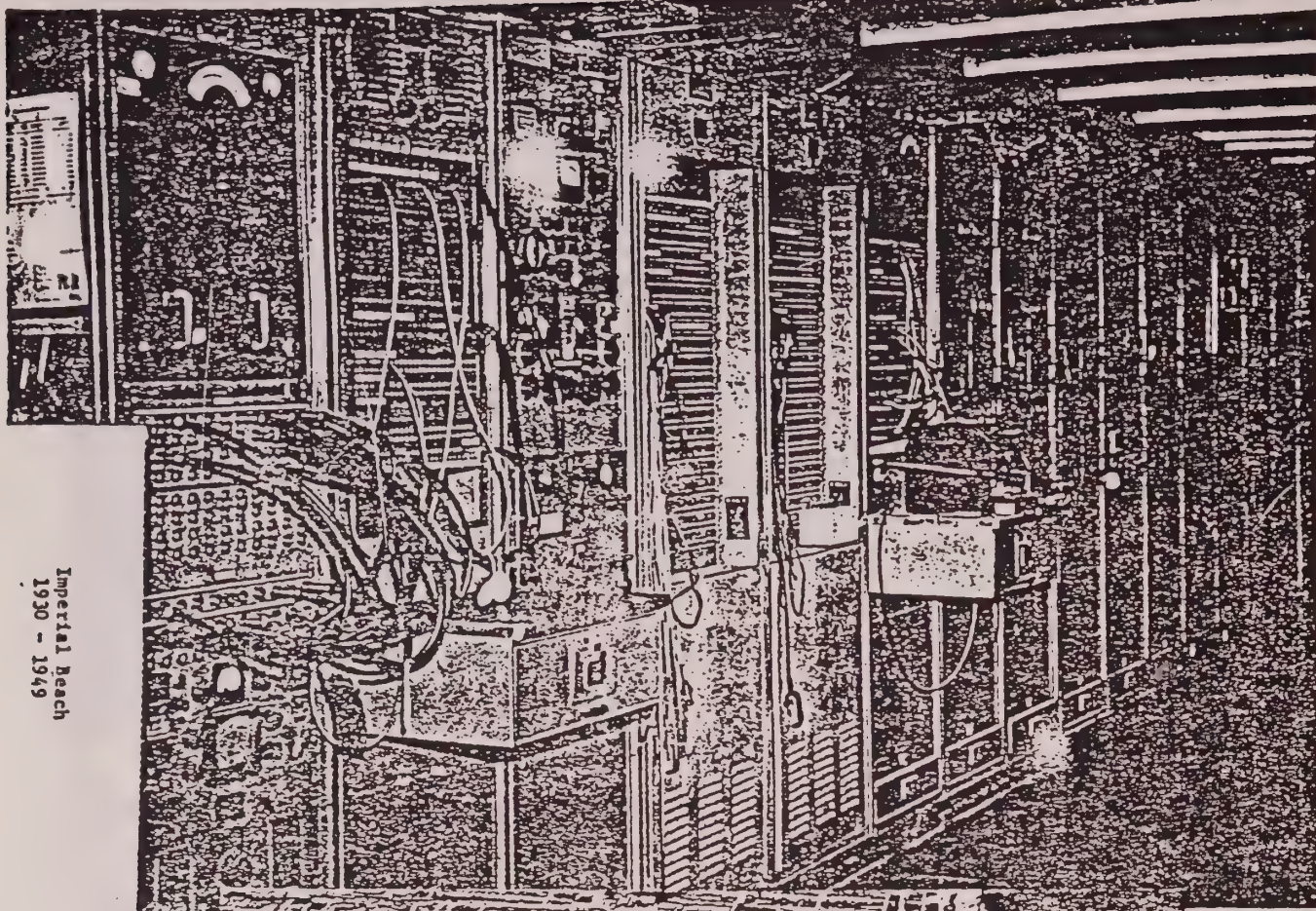
The "dinosaur cage" WULLENWEBER antenna at Naval Radio Receiving Facility
Imperial Beach, California.



HIGH FREQUENCY DIVERSITY RECEIVING
INSTALLATION NAVHAFSTA, I. H. 1943



Imperial Beach
15 Nov 1948



Imperial Beach
1930 - 1949



CARDINAL OBLIQUE of Radio Station,
Imperial Beach, Looking SOUTH.

April 12, 1963

"IT WAS WILD IN THOSE DAYS" from NAVCOMSTA San Diego Review
May 12, 1971.

During the first few years of the Navy Point Loma Radio Station, dependents were not allowed to live on the station. However, First Class Electrician O. D. Ginther's bride, Bertha, was determined to be as close to him as possible. At age seventeen, she set up a tent-house immediately outside the radio station grounds at Point Loma. This was the Ginthers' home for eight months. The tent-house was a lean-to one room dwelling. Not very large, the tent measured approximately eighteen feet by fifteen feet.

During the first few days of their marriage when Ginther had the duty, his wife recalls, "I was very brave, but there were too many coyotes and skunks around to be comfortable." In order to remedy this situation, when Ginther had the night watch, which was every four or five nights, Mrs. Ginther would pack a warm comforter and take her "watch" on a bench located in the station building.

Mrs. Ginther, at that time, picked up a habit which more than once proved profitable. She became quite proficient in shooting her husband's rifle. Rabbits roamed the area in large numbers and often times found their way to the Ginthers' table.

Living at Point Loma in 1911 was living in a wilderness. Trips to San Diego were scheduled usually at night as that was the best time to take liberty. However, such trips were limited by a number of factors. It seems that a moonlight night was the only time such trips could be made as flashlights were non-existent and "carrying a lantern was beneath one's dignity." The Ginthers would start out in the afternoon and come back on the last ferry which has been termed a "nickel snatcher." This ferry would dock at the Fort at Point Loma, however, the return trip was not all that simple. Many nights it would be 12 or 1AM and the Ginthers would be making their way up a cowpath to the wireless station and their tent-house.

Occasionally the station would hold a "Navy" party. These parties, many times "became quite rowdy." With no one to disturb, everyone would really whoop it up. It wasn't a luxurious life living at Navy Point Loma in 1911. "It was wild in those days, but worth it." (ED.NOTE: Mrs Ginther has since remarried and is now Mrs. Ernest Adams of La Mesa.)



APPENDIX X-1

ON A LEISURELY SUNDAY afternoon Mr. and Mrs. Ginther would take the station carriage and go riding. In the background is the Radio Station.

Navy's Radio San Diego Growing for 50 Years

Great Communication Center Started
Half Century Ago in Tiny Shack

Just 50 years ago next Saturday, a rickety wagon pulled away from a wharf near San Diego, laden to the axles, and for nine long hours the horses strained and pulled along dirt roads leading to San Diego.

Then a working party of sailors took over, guided by a few nervous and freshly trained bluejacket technicians, and a few hours later one of the world's most famous communication stations began to function.

That was the birth of Radio San Diego, the Navy's giant communication center which links the ships of the fleet, storm-tossed or becalmed, on the oceans of the world, to the great fleet base in San Diego.

50th Anniversary

Saturday the Navy will celebrate the 50th anniversary of the station, which years ago outgrew its humble beginnings until now it utilizes every marvel of communication technique for the major task of keeping the shore stations of this sector informed of the fleet's activities afloat.

The first equipment, which was dragged by horses along the muddy, rutted roads of Point Loma, was a simple Massie-type spark transmitter. It was only a few months after Marconi's great invention for sending messages without wires had been brought into general use. The U.S. Navy was still working with the Italian inventor to perfect the faulty and undependable device.

The Navy's brass-hats knew that such an invention was indispensable to the operation of a battle fleet. The elimination of the distance quotient from communications meant as much to ships afloat as did the metal hull and the development of the breechblock for naval armament.

New Nerve Center

Today the trim, yellow-painted radio shack on Point Loma has long been abandoned. The nerve center of the 11th Naval District communications is housed in the district headquarters building at the foot of Broadway in San Diego. And trimly dressed WAVE radiomen stand by the keyboards of electronic devices, replacing blue-clad Navy radiomen who now man equipment afloat.

And the signals from the teletype keyboards are sent into the air from towering steel masts, far from the original location at Point Loma.

Since 1916, the actual transmitting station has been situated in a forest of steel towers at Chollas Heights in the border city. In addition, there is a remote radio receiving station at Imperial Beach, on the coast far south of Point Loma.

Teletype Circuit

Most messages which come through the "Com 11" office, as 11th Naval District is known to communicators, are relayed by teletype, an extensive continental land line network that links San Diego with every important population and military center on the continent.

The network extends its invisible signal lines across the oceans by point-to-point radio circuits. Messages to ships afloat go by radio, either through the medium of voice, manual radio telegraph using the Morse dot-dash code, or by radio teletype.

The original radio San Diego went into a fresh phase of experimentation two years after it was established, when Dr. Lee DeForest came aboard the station after a voyage on the flagship of the Great White Fleet.

The little yellow bungalow

that housed the Navy's radio brains came in for more national recognition again in 1916, when the deluge that followed the Hatfield rain-making experiment cut communications to the southernmost portion of the station. Otay Dam had burst. Rail lines and telegraph wires were down in the cloudburst. And Radio San Diego shifted from its routine duties to serve as the only communications link between San Diego and the world outside the flood zone.

Once more, in December, 1941, Radio San Diego played a major communications role.

A. Wayne Prather, then a Navy lieutenant, was the duty officer at the station. Prather, now a civilian who lives at 4741 36th St., San Diego, can recall the details sharply.

Pearl Harbor Flash

First word of the Japanese attack on Pearl Harbor came crackling into the message center.

And Lt. Prather directed its rebroadcast to the rest of the naval establishment, and finally to the nation, through the facilities of the station on Point Loma.

When the little yellow radio shack on Point Loma was finally decommissioned and the present message center organization was put into operation in 1949, Prather was called in for the ceremonies.

He was presented with the station flag.

Chollas radio station

— Best duty in Navy?

By FRANK SALDANA
TRIBUNE Military Writer

Three 600-foot steel towers commanding a view of San Diego's skyline mark what might be considered choice Navy duty.

For the 22 Navy men and women assigned to the Naval Radio Transmitting Facility on top of Chollas Heights, duty is about as good as being stationed in their own hometowns.

"You might say that our worst form of punishment would be to transfer an offender," said Lt. Cmdr. Alan P. Hemphill, the officer in charge of the 73-acre communications site.

But disciplinary problems are rare. The duty is too good to be jeopardized. Morale is high.

Radiomen maintain round-the-clock watches in an air-conditioned master control room.

Here they monitor the thousands of frequencies used by the various commands in the 11th Naval District to send radio messages throughout the world.

Often the place is used as a relay station for other transmitter sites further north, but most of the traffic originates from commands south of Oxnard to the border.

More than two dozen transmitters — the exact number is classified — are serviced and maintained by electronic technicians.

Transmitting power ranges as high as 100,000 kilowatts, but rarely is that much power required.

"The trick is to get the best signal with the minimum amount of electricity," Hemphill said.

He said it is extremely rare when broadcast signals interfere with television or radio reception in nearby residences.

"I have a stereo in my office," he said. "If we're the least bit off frequency, I know it in a second and I am the first to call the control room."

"We believe in being good neighbors."

The center is the offspring of the first shore base established here in 1906 — the Point Loma Naval Wireless Station.

During World War I the word wireless was dropped in favor of

radio and technological advances dictated high ground and tall antennas.

The Navy Department authorized three major transmitting stations in the Pacific — the one 580 feet above sea level at Chollas, one at Pearl Harbor and the other at Cavite in the Philippines.

Chollas was put into commission in January 1917 and construction of the three supporting towers got under way.

The three horizontally striped red and white towers, which are visible throughout most of San Diego, support a nearly invisible triatic antenna suspended by wires at the center of the triangle formed by the towers.

"NPL," the call letters of Navy Point Loma transmitting station, was transferred to the Chollas site in 1919 when it went into operations. However, construction at the then isolated station was not completed until 1922.

The station is far from isolated today.

San Diego's growth has surrounded it with a bedroom community to the north, the Chollas reservoir and College Grove Shopping Center to the south and east and the city's Chollas operations center and sanitary fill to the west and south.

Despite the encroachment on the hilltop site, there remains a sense of isolation and remoteness, according

to the men and women who live and work there.

There is also a very homey, "dungaree" (working uniform) Navy atmosphere on the base that could almost rival a country club for its amenities.

"This is the first place my wife hasn't griped about the duty," said Jerry Oxenford, 25, an electronics technician second class.

Mrs. Kelly Schussler, wife of a radioman assigned to quarters at the station a couple of weeks ago, raved about her new home.

"Now the secret will get out. Everybody will want to be stationed here," he said.

He and his family live in one of the 11 sets of quarters provided for members of the communications systems command here.

"It is the best Navy housing we have ever had," she said. "And we have the best view of San Diego."

Her duplex has a panoramic view from the Coronado Islands past Point Loma and Mt. Soledad to the Palomar Mountain range to the north.

The unmarrieds assigned to the transmitter live in a two-story coed

bachelor enlisted quarters — the women . . . have the second floor and the men the first floor.

There was one exception.

Richard Crouchi, a radioman second class, and his bride of three weeks, Jean, a cryptograph technician, resided in separate rooms until their family unit was made available Friday.

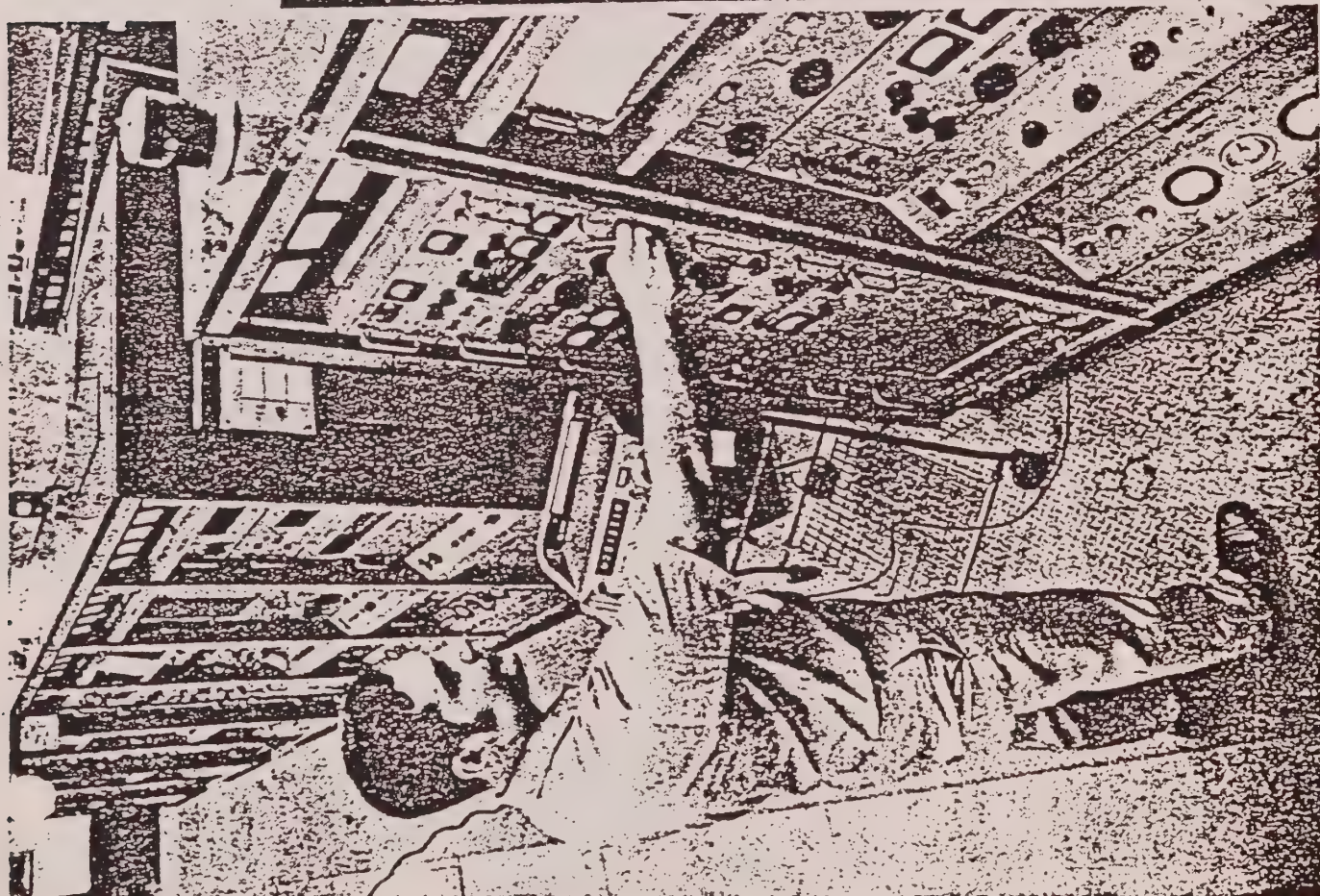
Besides having individual rooms in college-dorm-like quarters, the residents have a spacious lounge with fireplace and color television, a game room in their enclosed front porch, a large laundry room in the basement and a dining room.

Breakfast is prepared to individual taste and the other meals follow the Navy's master menu.

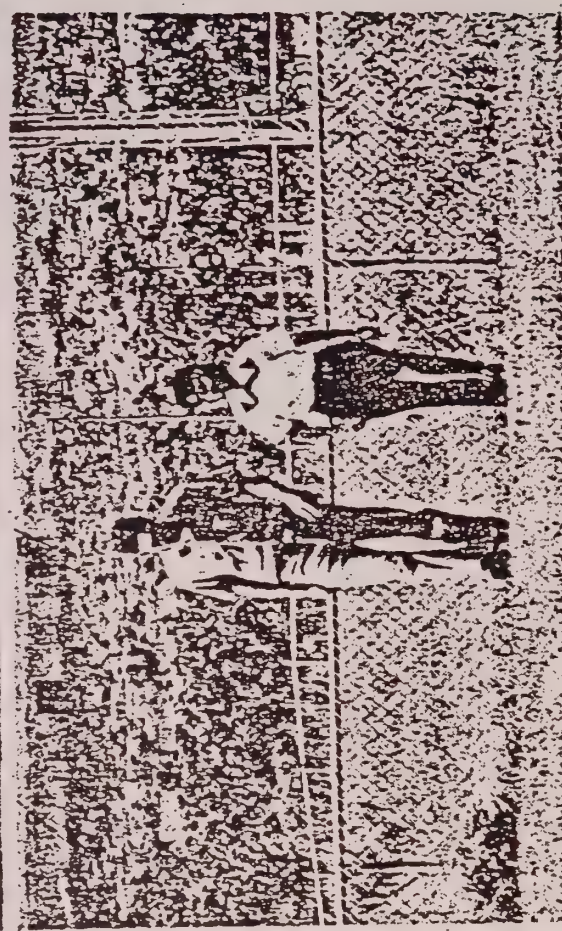
Recreational facilities include a lighted tennis court, a heated swimming pool, a racquetball court, picnic area and a clubhouse also used for in-service training.

Hemphill likes to point out that the recreational features came at no expense to the taxpayer.

"The men put the court together themselves," he said. "The pool was an abandoned water tank used to cool power equipment years ago. The men made the conversion."

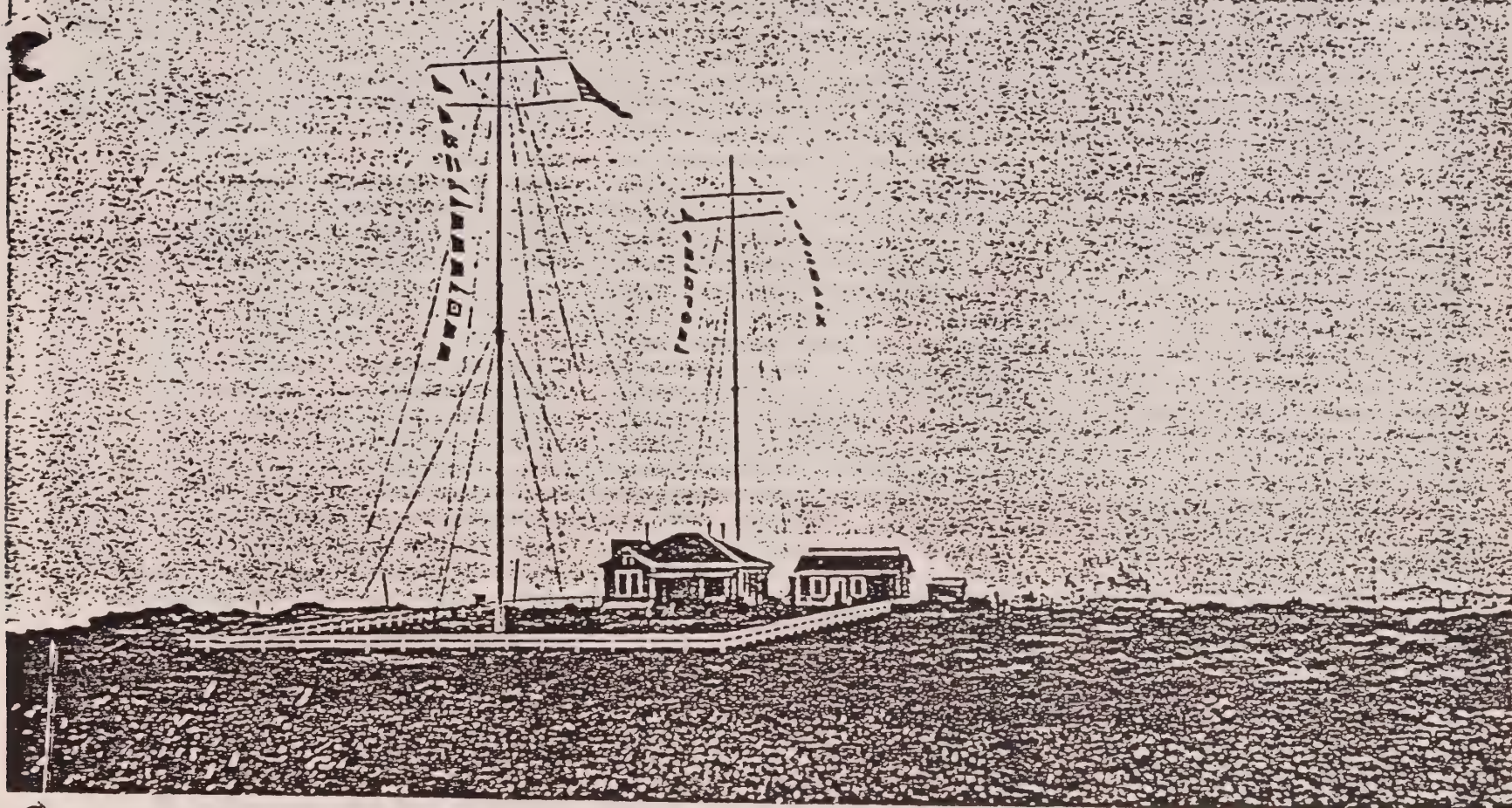


FAVORITE STATION — Navy personnel assigned to the Naval Radio Station in Chollas Heights usually have smooth sailing. In this composite photo, ETC Chief Kenneth Hathaway mans transmitter



center, left, while RM2 William Flesh relaxes in his room and ETN2 Richard Leeth and Chief RM Helen Contini inspect field, with view of skyline in background. — Photos by Dan Tichonchuk, Tribune staff

POINT LOMA CALLING



It was in 1906 that the navy wireless station at Point Loma was opened with the ear-splitting crash of an electric spark

By JERRY MacMULLEN

THE YOUNG chief petty officer pulled lustily on the halliards and a bright new flag rose to the truck of the mast beside a neat yellow cottage atop Point Loma. The chief—R. B. Stuart—secured the halliards and went inside, to a room containing a fantastic assortment of coils and switches and a massive telegraph key. Came the ear-splitting crash of a blue-white electric spark—and for hundreds of miles around, all and sundry were advised that Point Loma Wireless Station was open for business. The date—May 12, 1906.

Today's radio technicians would class as a Goldbergian dream the collection of instruments before that operator of nearly half a century ago. That old Massie spark transmitter would be a collector's item today, but it did its work nicely, back in 1906, when you worked on long wavelengths. They weren't even called "frequencies" then and if you could get

through to a ship a hundred miles away you considered yourself quite a boy.

From the standpoint of the spectacular, that old station had it all over the installations of today. The roar of the open spark-gap could be heard for half a mile and the room was cluttered up with marble switchboards and beautiful spirals of heavy brass and copper wire—helixes, they used to call them—which cast weird and intricate shadows on the walls when that blinding spark crashed into life. Modern vacuum-tube transmitters—or even receivers, for that matter—were still in the unfathomed future.

That was back in the days of the coherer, where messages were received by means of a doorbell which tapped on a glass tube full of silver filings instead of on a gong. A physicist invented the "magnetic detector" which had to be wound up every so often—and in which lurked, had they realized it, the germ of today's wire-recorder. Then someone found that certain crystals, notably galena, silicon and carbo-

rundum, would do the same thing and do it better. The crystal was a wonderful thing—but after every transmission, the operator had to feel around with a tiny wire, on the silver-grey lump of galena, to find a new spot of sensitivity; currents set up by the nearby spark had effectively fried the one which he had been using. It was a great day when Point Loma got a double-headed detector in which the galena was backed up by a beautiful purple-and-green lump of the less sensitive, but more durable, carborundum.

Ah, those halcyon days at old NPL! The cottage beside the two white masts was in a world of its own; the operators did their own cooking, and when roads to San Diego were impassable because of rain, it was a good thing that rabbits were plentiful, and a few shotgun shells provided dinner. Turkey, too, was not unknown at the station, to judge from occasional complaints by the late Katherine Tingley, who presided over the nearby Theosophical Institute, and probably was right in suspecting that birds which vanished from her coops eventually found their way into the navy's communication system.

In 1908, when President Theodore Roosevelt sent the Great White Fleet

round the world, NPL took part in a new, virtually untried experiment. Aboard the battleship *Connecticut*, flagship of the fleet, was Dr. Lee DeForest, who was experimenting with what he called an "audion"—a particularly fragile, globular electric light bulb with some added filament and a distressingly short life, which the good doctor had found was even better than the crystal detector—and which had possibilities for the transmission of the human voice. One of the first successful tests of the wireless telephone was between the *Connecticut* and Point Loma, and in those tests, radio broadcasting was being born. The experiment was more or less forgotten; the station was busy with its regular—and growing—message traffic.

"CQ de NPL"—All ships and stations, Point Loma calling—became well-known up and down the ether-lanes of the west. In fact, even in its pre-commissioning days the station had become known to many. They were able to hook things up well enough to handle some of the disaster messages from Mare Island, when quake and fire struck San Francisco, and the landlines were rendered useless. The little old cruiser *Chicago*, and the navy's five West Coast wireless stations then in commission, played a vital part in the relief work.

Stuart was one of the veteran wireless men when he put NPL into commission; he had gone into that line of work in 1902. He had only seven ships with which to work by the end of 1903—the battleships *Illinois*, *Kearsarge* and *Texas*, the cruisers *Olympia*, *Topeka* and *Baltimore*, and the repair-ship *Prairie*. During 1904 he was detached from his job as the lone operator in the *Texas* and came to the West Coast to begin work on the Pacific chain.

At certain periods of the day, the operator at NPL would pick up the day's newspaper and reach for the big brass telegraph key—

"CQ de NPL—Press—" In tiny wireless shacks on torpedo boats and armored cruisers, on tankers and passenger ships, operators adjusted their head-sets, did some final tinkering with the detector crystals, and settled back to copy down the events of the world. . . . There was growing pressure behind an outlandish idea that women should be allowed to vote. . . . A palatial liner, the *Titanic*, had struck an iceberg and gone down, with appalling loss of life. . . . In far-away Sarajevo, some wild-eyed zealot had assassinated a Grand Duke, and war might result. . . .

With the increasing range brought by new developments, Point Loma's voice reached farther into the air lanes, with both military and civilian traffic. When San Diego was isolated by floods in 1916, it was NPL which carried the bulk of communications with the outside world. To the extent of 5,000 words a day, the already heavily loaded facilities of the station were made available to the nation's

press services, to carry far and wide the story of San Diego's plight.

Around 1915, they put in a German Telefunken-type transmitter, and the crash of the open spark-gap was silenced for all time. The station now had a new voice; sweet and clear, that whistling 500-cycle note carried through the air lanes in sharp contrast to the lower voices of the ships and especially to the quavering croak of KPJ, the Marconi station whose mast arose from the then sandy wastes of Terminal Island.

Came World War I; a barbed-wire fence and Marine sentries ended the era in which any curious person might wander into the station and look around. There were more operators at Point Loma now, to care for the sharply rising traffic load, and in addition to the spark set they worked, by remote control, a gargantuan Poulsen arc transmitter which lived on direct current and illuminating gas, and which was located inland, at Chollas Heights. Many of those operators have since passed on and the ships which they worked have been dead these many years—the old *San Diego*, née *California*; the dainty little cruiser *Albany* which we had bought from Brazil during the Spanish-American War, and the former armed merchantman *Prairie*. They handled messages for the British sloop-of-war *Algerine* and *Shearwater*—a quaint pair of brigantine-rigged steamers—and with the immortal battleship *Oregon*. When the passenger liners *Yale* and *Harvard*, stripped of their finery and painted lead-color, left to ply the English channel as navy transports, it was NPL which handled their last messages from a Pacific station.

The postwar years saw wireless—by this time called "radio"—making marvelous advances. Crystal detectors gave way to vacuum tubes which also took over for transmission, as the spark sets

and the mushy-voiced arcs were declared illegal.

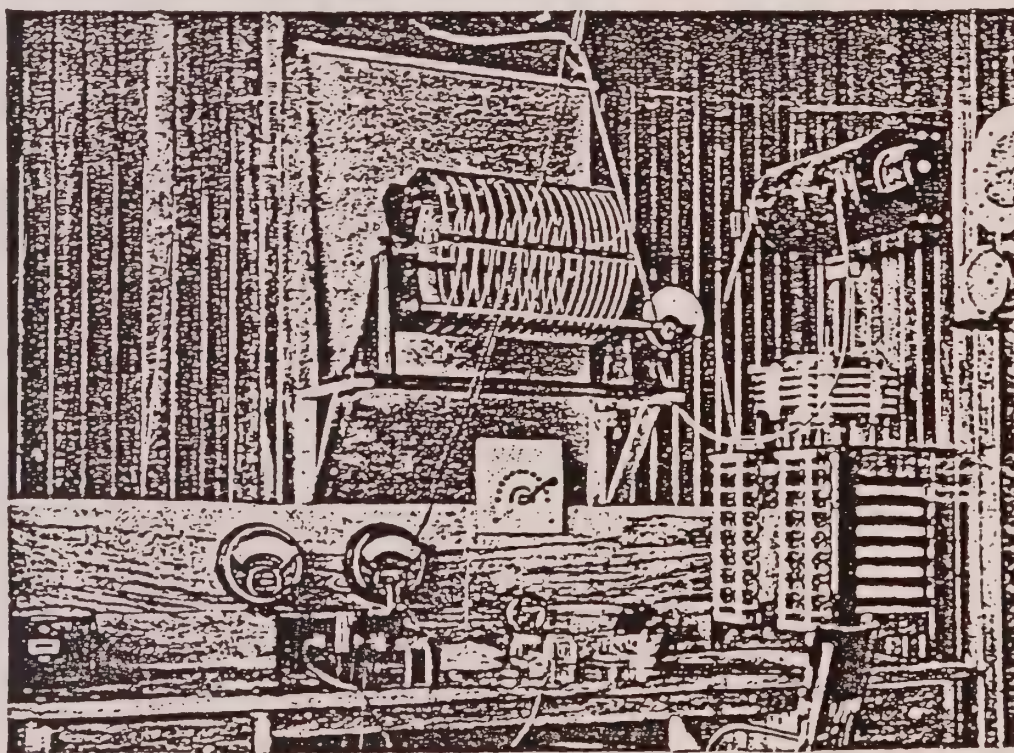
Then came the grim morning of December 7, 1941, when Point Loma's operators took down that fateful message—

"AIR RAID ON PEARL. THIS IS NO DRILL."

For the next 60 hours, Point Loma served the whole Pacific fleet, stepping in to replace the bombed facilities of Pearl Harbor Navy Yard. And while weary operators struggled under the increased load of message traffic, there was other hectic activity atop Point Loma. For, just as a bright young scientist of bygone years had dreamed of an electric light bulb which could talk, so a younger generation of electronics people had tackled the problem of reflecting waves which would warn of approaching aircraft. Scientists, both civilian and navy, manned the experimental radar equipment in shacks overlooking the sea, and set up 24-hour watches. By today's radar standards their stuff wasn't so much—but it was the best of its day.

Now the research people have taken over completely, and on a pleasant summer afternoon in 1949 the flag was hauled down momentarily to mark the passing of Radio Point Loma, whose buildings were turned over to the Navy Electronics Laboratory. One of the navy's leading electronics experts, R. B. Stuart, hauled down the flag—which was quite appropriate for it was he, as a C. P. O., who had first raised it 43 years before. Changed times have brought changed techniques, and more suitable locations for the transmitters and receivers have been found elsewhere in the San Diego area. But there is one link with the past which remains to this day—

NPL is still the call-sign for the navy at San Diego.



• The room was cluttered up with marble switchboards and beautiful spirals of brass and copper

At that time the Pacific Fleet consisted of the small cruisers CHICAGO, MARBLEHEAD and BOSTON, the gunboat YORKTOWN, the little torpedo-boat destroyers PAUL JONES and PERRY and the collier SATURN. Only two of them, the CHICAGO and BOSTON had wireless equipment. In those days there were no three letter and four letter calls with official standing. Point Loma had the call TM and the CHICAGO was CO. They gave her that call because it was also the call of the Western Union Telegraph office at Chicago.

At Point Arguello, there being no power from land lines, we had our own generator and used a Mare Island modified 1 KW transmitter with an open end transformer. The oscillator was of the direct coupled type with the spark gap in the center, and the condenser consisted of 24 sheets of 24" by 24" glass carrying 16" by 16" tinfoil sheets, centrally located with tinfoil tabs for connections. The receiving set was a "Stone" tuner. This tuner consisted of a coil of spaced wire which travelled from one full coil of wire wrapped around a wooden roller; the free end passed to an adjacent roller where it was wound, turn by turn as needed for tuning, by means of a crank. Hanscom's carborundum detector was used except when we tried out silicon, iron pyrites and galena, which sometimes worked better than the carborundum. The antenna was suspended from the 175 foot wooden mast by glazed porcelain insulators. Our distance in transmitting was generally less than a thousand miles at night, and two hundred miles in daytime. Static was a bad feature at this station.

My next duty was aboard the ARETHUSA. This steamer, built about 1884, had been a British tramp freighter, and during the Spanish-American war the Navy bought her, converted her cargo holds into tanks and used her to carry fresh water to the ships of the fleet. She had no evaporators and could make no fresh water, even for her own use. Another steamer bought at the same time, the IRIS, had twentyone evaporators and could make plenty of fresh water, but she was very slow.

The wireless equipment of the ARETHUSA was transferred to the IRIS by the writer in 1908. The transmitter was a Slaby-Arco (Telefunken) set which had a mercury interrupter; a stream of mercury from a tank containing ten pounds of it was pumped through a nozzle against a segmented plate to provide a pulsating current. This went into a 12 inch spark coil which emitted high voltage to the condenser, and through the spark gap and primary of the oscillation transformer. It was a very poor outfit and on only a few occasions could I manage to get over six hundred miles.

We used a Shoemaker receiver, a close coupled affair with a platinum wire and a cup of dilute sulphuric acid for a detector. This wire, only 1-10,000 of an inch in diameter, was silver coated for handling purposes; it was called Wollaston wire. In use it was necessary for the acid to burn the silver off, before we could get signals. The wire barely dipped into the cup of acid; the rolling of the ship would lift the wire out of the acid, and the breaking of contact would burn the end off the wire and we would have to prepare the wire end again for service. I learned that a bit of cotton would carry the acid, and by draping the end of the wire over the damp cotton I could operate when the ship rolled, even violently.

The IRIS had been the British steamer Dryden, later the Menemsha, built at Newcastle in 1884 and was 304 feet long, with a two cylinder engine. I paid off from the IRIS as Chief Electrician (now called Chief Electrician's Mate) on Washington's Birthday, 1910.

After leaving the Navy I was manager of the United Wireless station, PQ, at Monterey. One day I got an urgent call from CH (San Francisco) with a message for the steamer Hanalei. They couldn't reach her, so I tried her call, HN, and finally got a feeble little call. The operator, in a shaky fist, stated that he was Herbert Nuttall of Monterey and was answering his call, HN, for the first time. I asked him

THEY USED TO CALL IT WIRELESS
by Edward D. Stevens

Reprinted From The San Diego Historical Society Quarterly Vol. IX, January 1963.

I enlisted in the Navy aboard the flagship CHICAGO at San Diego on February 23, 1906, and though not assigned to the "wireless room" it was natural that I hung around there. My wireless experience began in San Francisco in 1905 as an amateur. William Larzalere was the first amateur in San Francisco and I became the second ham there.

My receiver had been a rolling-pin wrapped with bellwire as a tuner, and a coherer made by boring a hole in a piece of broomstick. The hole was filled with iron filings and the ends closed with zinc plugs, with a tapper made from a doorbell with the gong removed. My receiving condenser was an old telephone condenser of unknown values, and the telephone receiver had been discarded by the telephone company after it was badly damaged in a warehouse fire. My antenna was a single bellwire about 160 feet in length from a warehouse to my home, insulated by means of broken necks of bottles. My transmitter was a Ford spark-coil and a loading coil made by the old Electro Importing Company. The key was home made. With this equipment I communicated with Electrician Talmadge at Tatoosh Island, Washington, on several occasions.

Fred Ward, of the Carborundum Company at San Francisco, gave me a bucket of carborundum scraps and I constructed a detector using a piece of carborundum, with a phonograph needle screwed against it under pressure. It was so satisfactory that I took several of these detectors with me when I enlisted in the Navy. Two years after I had been using carborundum George Hanscom, Radio Aide at Mare Island Navy Yard, invented the very same thing, and it became standard in use in the coastal station

We were at sea on April 18, 1906, and although I was not officially attached to the wireless room, I copied the message from Mayor John L. Sehon of San Diego to Rear Admiral Goodrich commanding the Pacific Fleet. It read as follows:

"Your wireless message received. First earthquake shock in San Francisco about five fifteen a.m., report very great destruction in San Francisco and bay cities. Hundred buildings business section razed. Streets blockaded. Water mains generally over city broken and fire department rendered helpless. Report second and third shocks, third being most severe. Fire followed immediately over city generally. Attempted to check fires by blowing up buildings with dynamite. Palace Hotel reported down entirely and three or four hundred dead in ruins. Hobart Building has fallen on Post Office. Examiner Building badly wrecked. Call Building a complete wreck. Reported that military authorities have been requested to assume charge city. Requests made for transports to take dead bodies to sea for burial. All direct communications to San Francisco down. Message being sent by steamer across bay to Oakland. Impossible to estimate loss of life. Frightful force of earthquake felt along Market Street."
SEHON, Mayor.

This message must have been in reply to a request for information from Admiral Goodrich, and the new Point Loma wireless station was able to get through to the CHICAGO while others were not. With the wires down, the Southern Pacific Railroad sent their train orders to Yerba Buena Island, thence by wireless to the Farallones, again by wireless to Point Arguello (the station to which I was assigned in 1907) and Point Arguello passed them on to the Southern Pacific operator at Surf, where they placed on the wires. This was the first time in wireless history that train orders were sent to sea to control the trains.

to come in to the station, and that afternoon he came in, on his bicycle. He was about nine years old and apparently had assigned himself the call HN because those were his initials. I told him that the call HN belonged to the Hanalai and to change his to NTL, which was quite suitable for a boy named Nuttall. That was before the Navy had taken over all three letter and four letter calls beginning with N.

A boy in San Francisco, whose initials were CH, adopted that as his call, even though it was the call of the station operated by the San Francisco Chronicle. I was on the 4 to 12 shift one day when the steamer Queen sent out an SOS; she was afire in the forehold; and requested standby assistance from nearby ships. Then that darned kid butted in, calling someone in San Jose. I could not break him by radio, so I called him on the telephone and told him that the Queen was on fire and asked him to stay off the air. He told me he would stay off for five minutes but would then come back again. When the Queen was safe, I called R. Y. Cadmus, the Wireless Telegraph Supervisor at the U. S. Custom House and told him all about it. He closed his office, went to the kid's home, personally dismantled the wireless set and took it to the Custom House for safekeeping. The next day the kid and his mother called at the U. S. Marshal's office, where they got the sweetest bawling out that could be given in polite language. Much to my delight, he didn't get his wireless set back for a year.

One day, though, a San Diego amateur was a real help. Robert Capps, son of the City Engineer of San Diego, heard me calling Point Loma, TM. TM did not answer, so Capps called me on the IRIS, enroute from Magdalena Bay to Mare Island. I told him to tell TM I was calling him, and then I heard Capps call TM, and heard TM tell him that they could not hear my signals. I was using the Telefunken coil and mercury rectifier, and it was a lousy, fuzzy signal that came from my set. So I called TM and Capps both on the same signal and told them that our condenser was broken down and we were about fifty miles from San Diego, traveling about four miles an hour under jury rig. Could they send a tug boat? TM said that they were sending the tug IRIQUOIS to our help, but that she had no wireless and we should send up a search-to-cloud signal. The IRIS had no searchlight, so we cruised around under a jib and staysail, and then the fog shut in and we couldn't find the IRIQUOIS. We cruised to Santa Rosa Island and then sailed south to San Pedro where our engines were repaired. Poor old IRIS! With her compound engine running full speed, we could make only five knots with a good tail wind.

Our commanding officer, LCDR B. B. Bierer, listened to my report, and sent Robert Capps a fine letter of thanks for the good work in helping Navy Wireless.

ITEM IN THE SAN DIEGO UNION, SATURDAY, May 19, 1906.

Wireless communication is now a verity nearly the full length of the California Coast. Chief Electrician Hanscom of the United States Department of Wireless Telegraph, who is under LT Gearing of Mare Island, has been here for a month or more installing the San Diego station. He finished his task yesterday and reported by wireless to Admiral McCalla, Commandant at Mare Island. His message was to the effect that the station on Point Loma was ready for business.

Admiral McCalla replied by a message congratulating Mr. Hanscom on the celerity with which he had completed his work. The electrician not only picked up the Mare Island station, but the Farallon Islands at the entrance to the San Francisco harbor and Point Arguello near Santa Barbara.

The wonderful "aerograms" sped through the 500 or more miles of space as readily as they cross the bay from the Point Loma station to the Granger block station!

circa 1909-1910

arenda	*NBA	AC13
comac	*NBC	AT
tiye	*NBD	AT
ams	*NBE	ScGbt
der	*NBF	SS 3
leen	*NBG	PY
ax	*NBH	AC14
abama	*NBH	BB 8
bany	*NBJ	C
batross	*NBK	PG
ert	*NBL	PG
xander	*NBM	AC
ice	*NBN	AT
liance	*NBO	ScGbt
varado	*NBP	PG
sphitrite ...	*NBQ	EM 2
napolis	*NBR	PG10
ache	*NBS	AT
ayat	*NBT	PG
ethusa	*NBU	AO 7
kansas	*NBV	BB33
lanta	*NBW	C
gley	*NCE	TB24
iley	*NCF	TB21
inbridge	*NCG	DD 1
ltimore	*NCH	C 3
rney	*NCI	TB25
rracuda	*NCJ	BB21
rry	*NCK	DD 2
nnin' on	*NCL	PG 4
ldle	*NCM	TB26
mingham	*NCN	CL 2
ikley	*NCO	TB27
nita	*NCP	SS15
ston	*NCQ	C
xer	*NCR	Brig.
ooklyn	*NCS	AGR 3
utus	*NCT	AC15
falo	*NCU	ScStr
rrows	*NCV	DD29
esar	*NCY	AC16
ifornia	*NCZ	ACR 6
stine	*NDA	PG 6
ltic	*NDB	AF 2
arleston	*NDC	C22
attanooaga ..	*NDE	CL6
auncey	*NDF	DD 3
ester	*NDG	CL 1
eyenne	*NDH	EM10
icago	*NDI	C
ickasaw	*NDJ	Tug
ctaw	*NDK	YT26
cinnati	*NDL	C 7
eland	*NDM	CL9
lorado	*NDN	ACR 7
umbia	*NDO	CL2
ncord	*NDP	PG 3
necticut	*NDQ	BB18
nstellation ..	*NDR	Fr
nstitution	*NDS	Fr
ven	*NDT	THLO
igor	*NDU	AF
umberland ...	*NDV	IX 8
shing	*NDW	TB 1
tlefish	*NDX	SS11
lops	*NDY	AC
ilgren	*NEG	TB 9
ie	*NEH	DD 4
vis	*NEI	TB12
atur	*NEJ	DD 5
aware	*NEK	BB28
De Long.....	*NEL	TB28
Denver	*NEM	CL4
Des Moines ...	*NEN	CL5
Detroit	*NEO	CL0
Dixie	*NEP	AD 1
Dolphin	*NEQ	PG24
Don Juan de Austria		
	*NER	Gbt
Dorothea	*NES	Gbt
Drayton	*NET	DD23
Dubuque	*NEU	PG17
Du Pont.....	*NEV	TB 7
Eagle	*NFC	PY
Eagre	*NFD	SchY
Elcano	*NFE	PG38
Elfrida	*NFG	PY
Enterprise	*NFH	ScSlp
Ericsson	*NFI	TB 2
Essex	*NFJ	ScStr
Farragut	*NFP	TB11
Fish Hawk....	*NFQ	ScStr
Florida	*NFR	EM 9
Flusser	*NFS	DD20
Foote	*NFT	TB 3
Fortune	*NFU	ScStr
Fox	*NFV	TB13
Franklin	*NFW	ScFr
Frolic	*NFX	PY
Galveston	*NGD	CL7
General Alva...	*NGE	AG 5
Georgia	*NGF	BB15
Glacier	*NGH	AF 4
Gloucester ...	*NGI	Gbt
Goldsborough ..	*NGJ	TB20
Gopher	*NGK	Gbt
Grampus	*NGL	SS 4
Grayling	*NGM	SS18
Gwin	*NGN	TB16
Hancock	*NGT	AP 3
Hannibal	*NGU	AG 1
Hartford	*NGV	ScSlp
Hawk	*NGW	PY 2
Hector	*NGX	AC 7
Helena	*NGY	PG 9
Hercules	*NGZ	YT13
Hist	*NHA	ScStr
Holland	*NHB	SS 1
Holland		
Hopkins	*NHC	DD 6
Hornet	*NHD	Yacht
Hull	*NHE	DD 7
Huntress	*NHF	Sch
Idaho	*NHN	BB24
Illinois	*NHO	BB 7
Independence ..	*NHP	SL
Indiana	*NHQ	BB 1
Intrepid	*NHR	Bark
Ionie	*NHS	StSlp
Iowa	*NHT	BB 4
Iris	*NHU	ScStr
Iroquois	*NHV	AT46
Isla de Cuba...	*NHW	Gbt
Isla de Luzon..	*NHX	Gbt
Iwana	*NHY	YT 2
Jupiter	*NIE	AC 3
Justin	*NIF	Sch
Kansas	*NIO	BB21
Kearsarge	*NIP	BB 5
Kentucky	*NIQ	BB 6
Lamson	*NIW	DD18
Lancaster	*NIX	ScSlp
Lawrence	*NIY	DD 8
Lebanon	*NIZ	AG 2
Leonidas	*NJA	AD 7
Louisiana	*NJB	BB19
Macedonough ..	*NJH	TB 9
Machias	*NII	PG 5
Mackenzie	*NIK	TB17
Maine	*NIL	BB10
Manila	*NIM	Sch
Manly	*NIN	TB

now is type up the message with the address on it, send it over the primary ship-shore circuit or a termination, if they have one, and the computer system will add all of the routing indicators, put it in the proper format to send it on the Department of Defense System. It has cut out a lot of the work that the radioman had to do in making changes to the routing indicator publications. Those changes would come in most daily. It took one man just about full time just to keep up with the changes to that publication. Consequently our radio shack manning has gone down a bit because we no longer have to do that.

On the shore side, the automated system will automatically screen all messages that are coming in to it, to go out on the fleet broadcast. If a message is destined to a destroyer or one of the heavies, it will put it out on the right channel and, if everything in the format is right, the operator at the communication station will never see it. It is not uncommon to process ten thousand messages a day through this system and the error rate may be 1 in 25,000 that they have a reject.

On our primary ship-shore circuit we are primarily using the satellite. There is a primary ship-shore, one-access channel that we can use to send out our traffic but it becomes very congested because everyone is trying to use the same channel. What they have devised is called a COMMON-USER DIGITAL INFORMATION EXCHANGE SYSTEM. It is on a time sharing basis. The computer on the shore side will query the computer on the ship side and ask the ship computer if it has any traffic. Ships having traffic will just feed their messages into the system and they will sit there until the shore computer picks them off, in ten second sweeps from each subscriber ship, until all of the messages have been collected into the shore system for further relay to their destinations. This continues on a round the clock basis with the shore system gathering the messages whenever they are fed into the ships' computers.

Some subscribers also receive their traffic on this system. Large ships with flags on board handle much more traffic. They are equipped to pass messages both ways using this time sharing system. On the broadcast they just copy the common channel and pick up all the weather messages. On the smaller ships we still use the broadcast as the primary method of receiving communications from the shore side.

When the satellite first came out everyone thought it was the greatest thing going and were using it extensively. The first time that they ran into problems on the satellite and had to revert to HF, within a matter of 24 hours everything came to a standstill. Messages weren't going anywhere. They found that the operators didn't know how to come up on their circuits anymore. Once they did come up they were in such a hurry to get their messages out they weren't paying any attention to circuit discipline. I read an article in the NavComSta Bulletin written in the 1940s that if the net control station didn't have positive control on the circuit that you couldn't do anything. The same thing holds true today. If the operators aren't listening when they come up to send traffic it will take a long time to clear that traffic.

They suddenly realized that they had better go back and do some training in the use of HF for some of our communicating and not rely so heavily on the satellite. The way we are operating now, the primary broadcast is still on the satellite and the ships that have automated systems still send their priority and above traffic by satellite. All routine traffic has to go over the primary ship-shore HF circuits. Slowly but surely we are getting back the expertise so that we can operate on HF.

Periodically now they just take the satellite off the air altogether. Then, when a ship is unable to come up on the HF circuits and traffic is delayed, the captain will surely want to know why.

We are receiving a pretty good mix in there now and it seems reinforced in our schools. In our basic radioman schools we are not teaching satellite at all. We basically teach HF equipment and how to operate in the HF environment. Once they get out there on the ship it doesn't take them that long to become familiar with operation on the satellite.

Morse code is basically in a standby mode. If they ever have to use it, hopefully we will have some operators that are proficient. The Navy does not have any CW operators on the shore side. The Coast Guard handles all of the ship-shore communications that are coming through on CW.

Since communications became automated on board ship, we don't need as many people in the radio gang. It hurts us in a way because three or four persons can easily handle the radio traffic but it is difficult, with reduced personnel, to keep up with the maintenance especially the antenna systems. We gained a little bit but we lost a little too.

The satellite, besides supporting teletype operations, also provides voice communications. About three weeks ago, Admiral Watkins, Chief of Naval Operations, was on national television. He was being interviewed about the crisis in Beirut. He made a statement that by use of the satellite he was able to pick up a phone in his bedroom and have almost instantaneous communication with the Colonel who was in charge of the Beirut contingent. The Colonel was standing right in his bunker giving CNO a second by second breakdown of what was going on. That is what satellite communication has done for us. He also made a statement that 75% of our DOD communications are now on satellite.

The September issue of the National Geographic magazine has an excellent article about all of the various applications that we now have for the use of communication satellites not only in the military but also the applications for the civilian community such as broadcast TV, radio navigation, etc. It also has a good article about their vulnerability - about the systems we are working on to knock out the Russian satellites and how the Russians plan to knock out our satellites, if worse came to worse and we got into a bit of a hassle.

We know that there is a possibility that some day the satellite might not be there so we are trying to build up our expertise in using HF circuits for our communications back to where we were able to operate 20 or 25 years ago.

One of the questions the Colonel (LTCOL John J. Reber, Chairman of the Old Timer Communicators, Southern California) asked in his letter was whether we planned to stockpile old vacuum tube equipment in case something happened and we had to fall back on it. I did a little research on it with some of our electronic people and as far as we can find out, no. If something happens we have to go with the equipment we are now using. Now all of our HF equipment is integrated circuit so we have some tubes in it, particularly in the power amplifier stages, but everything we have out there is solid state.

The transceivers and other equipment that we are using in our automated communications also has made the maintenance easier. Now they have built-in test equipment in these transceivers and in some of the other equipment that we use. Basically all the technician has to/is go through some of the meter positions. If he doesn't get the correct readings he looks in his book and it will tell him exactly which circuit board to go to. He just reaches in, pulls out the board and pops in a new one, and that's it!

Address by Senior Chief Radioman Alexander McGilvray
of the Communication School, Naval Training Center, San Diego,
to the members of the Old Timers Communicators, Southern California,
at their October 1983 meeting at Caesar's in Mission Valley.

"Probably the greatest advance in communications in the last 25 or 30 years has been the automation, initially started with replacement of Morse code operators with teletype machines. The teletype machines had been around for quite a while but they really didn't have a good application in Naval communications or Fleet communications until the late fifties. The machines that were available up to that time weren't quite built to withstand rigorous shipboard use. They couldn't take a heavy roll or the buffeting experienced on smaller ships. Morse code at that time was used as the primary method of transmitting messages.

In the late fifties, the Teletype Corporation came out with the Model 28 machine and they, and others, have been the mainstay of our fleet communications since that time. They were very rugged and they could withstand quite a beating out there on the ships. They were all shock mounted and made copy through about anything.

In the early sixties on-line encryption devices came into general use and that relegated Morse code operators to a secondary position as far as fleet communications was concerned. The fleet broadcast, after that time, from the sixties on, was mostly multi-channel, on-line encrypted.

The Navy maintained CW training in our schools until early in 1970. The high tempo operations during the Vietnam conflict pretty much killed off CW other than for a few task groups operating out there. Ship shore communications was strictly by teletypewriter.

The thing that we are looking at now, that will replace teletypewriters, is automated systems using video display terminals and computers.

We are still training our people in Morse code operating. We still require that every ship have at least two operators on board. Currently we are training about 20% of our new recruits, who are coming through our radioman schools, in CW operating. About the only application that they are getting use in it is on the drill circuits that are held on a weekly basis. When they go out and operate as a task group, there are also midnight drill circuits that they use. But proficiency in Morse code operating is not what it was 20 years ago. If we had to use it in real life situations we have very few people out there that are really capable of communicating using CW as a primary method. I was taught Morse code when I went through radioman school and took six months of it. When I went aboard the RANGER, my first six months was as a CW operator copying the weather schedules and sending messages out by Morse telegraphy. Since that time I have only used it once and that was in 1978 when we were operating with the Pakistan Navy.

The automated systems that we have today are replacing a lot of the manual things that we used to do. The shore side of our communications has been automated for quite a while. Shipboard communications, within the last ten years, has seen a lot of automation.

The mainstay of our system of Naval communications is what we call the Naval Communication Processing and Routing System. The Naval communication Area Master Stations use that as the interface between our ship-shore circuits and the Department of Defense automated system.

The radioman, many years ago when he was routing his message traffic and sending it over primary ship-shore circuits, had to assign all of the routing indicators to it. The automated systems we have now will do that for him. Basically all we need to do

circa 1909-1910 .

Pages 125 & 126 of Adams Morgan Co. catalog. Obvious omissions. 1975 rearrangement into alphabetical name sequence for the OTC archives. Typed symbols were effective Jul 1920.

Vessel	Call	De Long	Lebanon	Paulding
Abarenda	*NBA AC13	*NEL TB28	*NIZ AG 2	*NON DD2
Accommac	*NBC AT	*NEM C14	*NJA AD 7	*NOP DD1
Active	*NBD AT	*NEN C15	*NJB BB19	*NOO YT2
Adams	*NBE ScGbt	*NEO C10	*NJJ TB 9	*NOR YT
Adder	*NBF SS 3	*NEP AD 1	*NJJ PG 5	*NOS YT
Aileen	*NBC PY	*NEQ PG24	*NJK TB17	*NOT ACR
Ajax	*NBH AC14	*NER Gbt	*NKL BB10	*NOU ScS
Alabama	*NBH BB 8	*NES Gbt	*NIM Sch	*NOV YT
Albany	*NBH C	*NET DD23	*NIN TB23	*NOW Gbt
Albatross	*NBK PG	*NEU PG17	*NJO C11	*NOX DD2
Alert	*NBL PG	*NEV TB 7	*NJP AC	*NOY DD1
Alexander	*NBM AC	*NFC PY	*NIQ PG15	*NOZ PG
Alice	*NBN AT	*NFD SchY	*NJR AC 6	*NOA C
Alliance	*NBO ScGbt	*NFE PG38	*NJS ACR 8	*NOR SS2
Alvarado	*NBP PG	*NFG PY	*NJT BB 2	*NOC SS
Amphitrite	*NBQ BM 2	*NFH ScSlp	*NJU YT15	*NOD YT4
Annapolis	*NBR PG10	*NFI TB 2	*NIV PY 1	*NOE SS
Apache	*NBS AT	*NFJ ScStr	*NJW DD28	*NOF AF
Arayat	*NBT PG	*NFP TB11	*NIX TB18	*NOG YT2
Arethusa	*NBU AO 7	*NFO ScStr	*NIY ScStr	*NOH SS
Arkansas	*NBV BB33	*NFR BM 9	*NJZ BB27	*NOI TB
Atlanta	*NBW C	*NFS DD20	*NKA C21	*NOJ Slp
Bagley	*NCE TB24	*NFT TB 3	*NKB Gbt	*NOK YT5
Bailey	*NCF TB21	*NFU ScStr	*NKC C13	*NOL SS
Bainbridge	*NCG DD 1	*NFV TB13	*NKD BB22	*NOM Aux
Baltimore	*NCH C 3	*NFW ScFr	*NKE BB23	*NON DD1
Barney	*NCI TB25	*NFX PY	*NKF BB11	*NOO DD1
Barracuda	*NCJ SS21	*NCD C17	*NKG SS 5	*NOP PG1
Barry	*NCK DD 2	*NCE AG 5	*NKH YT17	*NOR AR
Bennington	*NCL PG 4	*NCF BB15	*NKI ScSlp	*NOS Mon
Biddle	*NCM TB26	*NGH AF 4	*NKJ ScStr	*NOW PG4
Birmingham	*NCN CL 2	*NGI Gbt	*NKM ACR13	*NRA AS
Blackley	*NCO TB27	*NGJ TB20	*NKN BM 6	*NRB C 8
Bonita	*NCP SS15	*NGK Gbt	*NKO C 9	*NRC
Boston	*NCQ C	*NGL SS 4	*NKP TB14	*NRD
Boxer	*NCR Brig.	*NGM SS18	*NRV AG 3	*NRE DD21
Brooklyn	*NCS ACR 3	*NGN TB16	*NRW AT 3	*NRF IX2
Brutus	*NCT AC15	*NGT AP 3	*NRX SS17	*NRG AH
Buffalo	*NCU ScStr	*NGU AG 1	*NSY PG 7	*NRH
Burrows	*NCV DD29	*NGV ScSlp	*NKZ AT52	*NRI BB17
Caesar	*NCY AC16	*NGW PY 2	*NLE Error	*NRJ
California	*NCZ ACR 6	*NGX AC 7	*NMA BB14	*NRK
Castine	*NDA PG 6	*NGY PG 9	*NMB AC17	*NRL TB 1
Celtic	*NDB AF 2	*NGZ YT13	*NMC BM 8	*NRM DD22
Charleston	*NDC C22	*NHA ScStr	*NMD C 1	*NRN TB 8
Chattanooga	*NDE C16	*NHB SS 1	*NS BB25	*NRZ CL 3
Chauncey	*NDF DD 3	*NHD DD 6	*NME BB25	*NSA SS19
Chester	*NDG CL 1	*NHE DD 7	*NMF BB16	*NSB PG41
Cheyenne	*NDH BM10	*NHF Sch	*NMG C	*NSC YT 5
Chicago	*NDI C	*NHG BB24	*NMH PG12	*NSD PG
Chickasaw	*NDJ Tug	*NHN BB 7	*NMACR 2	*NSE C 5
Choctaw	*NDK YT26	*NHO BB 7	*NMA ScStr	*NSF AG 4
Cincinnati	*NDL C 7	*NHP SL	*NML Gbt	*NSG PY 3
Cleveland	*NDM C19	*NHQ BB 1	*NS NS	*NSH SS19
Colorado	*NDN ACR 7	*NHR Bark	*NSA BB29	*NSI Schago
Columbia	*NDO C12	*NHS StSlp	*NSB SS 9	*NSJ Severn
Concord	*NDP PG 3	*NHT BB 4	*NSC BB12	*NSK Shark
Connecticut	*NDQ BB18	*NHU ScStr	*NSD C 6	*NSL Shubrick
Constellation	*NDR Fr	*NHV AT46	*NSM C 6	*NSN Sioux
Constitution	*NDS Fr	*NIW BB24	*NSM ScStr	*NSO Siren
Craven	*NDT TB10	*NIH Gbt	*NSM Gbt	*NSP Skate
Croft	*NDU AF	*NIH Gbt	*NSM Gbt	*NSP Skipjack
Cumberland	*NDV IX 8	*NIH Gbt	*NSM Gbt	*NSP Whipple
Cushing	*NDW TB 1	*NIE AC 3	*NSM Gbt	*NSW Wilkes
Cuttlefish	*NDX SS11	*NIF Sch	*NSM Gbt	*NSW Wilmington
Cyclops	*NDY AC	*NIO BB21	*NSM Gbt	*NSW Winslow
Dahlgren	*NEG TB 9	*NIP BB 5	*NSM Gbt	*NSW Winslow
Dale	*NEH DD 4	*NIQ BB 6	*NSM Gbt	*NSW Winslow
Davis	*NEI TB12	*NIW DD18	*NSM Gbt	*NSW Winslow
Decatur	*NEJ DD 5	*NIX ScSlp	*NSM Gbt	*NSW Winslow
Delaware	*NEK BB28	*NIY DD 8	*NSM Gbt	*NSW Winslow

We are looking mostly at depot level maintenance on these things. The card comes out. It is sent to the depot. They repair it and send it back out to the fleet. So they have gone a long way on this.

They have made it so simple on one of these pieces of equipment that the radioman can do the testing himself. He just pulls out the drawer, puts it into the self-test mode and runs it through the test sequence. A little green light will come on if everything is alright on each card as he goes through the steps. If a red light comes on instead of the green, he just pulls out the board and puts in a new one. Any radioman can do that kind of maintenance!

The radioman is now basically an operator not a technician. As of 1970, it was no longer a requirement that the radioman be trained in basic electricity and electronics. The electronic technician has the whole show as far as maintaining our equipment. We pretty much just trouble shoot it down to the particular piece of equipment that we know is wrong then we turn it over to the electronic technician for repair.

I see in the future, as we get more and more into automated message processing systems, that the radioman will become more of a data processor. We will still have some circuits to come up on so we will still have to have some systems knowledge but the main effort for the radioman will be in data processing. We can have data systems technicians and data processors in the communication gang.

We have gone farther and farther away from the actual technician for the radioman and strictly into operating the circuits and handling the message traffic. Everything that I learned in basic radioman school about basic electricity and electronics is long gone. The same is true for most of the radiomen. We really miss that training. In the advanced schools they don't teach much electricity and electronics."

* * * * *

Question and answer session:

What happens when the main fuse blows?

They ran into a problem on some of the newer ships that are fully automated and by fully automated I mean the guy just sits there at the keyboard and tells the system which transmitter, receiver and antenna he wants to use. The computer sets everything up. He doesn't even go to the transmitter. He doesn't go to the patch panel. He tells the computer to do all of that. And when they installed the system, they hardwired everything. The first time they dropped the load, they couldn't even talk. They had no manual backup. The guy couldn't go in there and manually set up a circuit. So they had to go back to the drawing board.

What about communication with aircraft?

Aircraft do have access to a satellite channel. They are teaching CW to aircraft operators and they do use it at times but basically they are using satellite for long range communications. Ship to air is usually UHF voice.

What about intership communications during tactical maneuvers?

Our tactical circuits are basically UHF voice. The signalmen get a workout during maneuvers. We do maintain a task group teletype circuit but it is mainly used for ministrative and operational traffic.

* * * * *

ELLERY W. STONE
Rear Admiral, U.S.N.R., (Retired)
District Communication Superintendent (DCS) of the 11th Naval District
and Officer in Charge of the U. S. Naval Radio Stations, San Diego 1917-1919.

(Excerpts from an article in the December 18, 1979, issue of the Society of
Wireless Pioneers "SPARKS JOURNAL" by Fred Rosebury)

"Ellery started as a ham in 1908 or 1909 when he was a high school student. In 1910, when he was sixteen, he tuned in one day to the 600 meter band and to his surprise he heard a distress call (CQD or SOS) from a coasting vessel, the SS Queen, bound for Eureka. As there was no response from anyone, after a few minutes, he went to the phone and called the San Francisco maritime station "PH" (now KPH) and then the U. S. Coast Guard. Later he phoned the Oakland TRIBUNE to find out what happened, if anything. He learned that the ship had been rescued by the Coast Guard and all hands were safe. The editor wanted to know who was calling; when Ellery told him it was he who had notified "PH" and the Coast Guard, the editor asked him to stop in on his way to school next morning to be interviewed and to have his picture taken.

His first transmitter was a 1/2 kw spark which he built in his home at 317 Lee Street, Oakland, just north of Lake Merritt. The high voltage transformer, wound by himself - the "pig" he called it, had its secondary insulated with melted paraffin. The condenser was built up out of Belgian plate glass with tinfoil sheets cemented to the glass with white of egg.

For the receiver, his first detector was carbon and needle, from which he went by stages to various types of electrolytic devices, then carborundum. Some of these required a local battery. This was followed by silicon, galena, and at last a DeForest "Audion," a gassy "soft" tube, invented only a few years earlier, a tube which would go blue if the B-battery was more than 45 volts. He found a temperamental glass-blower, specializing in the repair of x-ray tubes, who repumped his Audion down too hard. Since there was no amplification beyond the detector stage, a thermionic tube had its greatest sensitivity just short of this blue ionization point. Ellery and a ham friend, Palmer Hewett, who lived on a farm at Hollister, California, found that when the tube was warm it became more sensitive. They figured the heat was driving the occluded gases out of the tube elements and the glass walls, thus reducing the degree of high vacuum. They mounted the Audion head downward in a glass beaker of oil under which they had a spirit lamp with an adjustable flame. By controlling the temperature of the oil precisely, they were able to get maximum sensitivity. They also found that they could "soup it up" still further with a U-shaped magnet from a discarded car magneto. In exactly the right position this magnet deflected the electron stream between the filament, grid and plate, to obtain an absolute and critical maximum of efficiency, so necessary for DX reception without amplifiers.

Today, we are so accustomed to the use of superheterodyne and multistage amplifier circuits that it is hard to conceive of getting along without them, and it is really amazing what sort of long-distance communication Ellery Stone and his fellow hams were able to achieve in the early days. When Ellery was seventeen he designed a rotary quenched gap which Haller Cunningham on Lower Market Street in San Francisco made up for him. He found that he could get a Poulsen-arc effect by dripping alcohol on the sealed in spark gap!

The U. S. Ship Act went into effect in 1910 and Ellery got a Limited Commercial station license for his ham outfit and a Commercial Operators License for himself, December 13, 1912. R. B. Woolverton became the Radio Inspector in the San Francisco area, as did W. D. Terrell in New York. The Radio Division, then under the Department

of Commerce, was almost immediately inundated with a large number of applications for operator and station licenses because of the Act, for ship, maritime shore stations and hams. Finding himself unable to handle this flood of paperwork, Woolverton got permission to hire an assistant for thirty days. This was in early 1912. Ellery, then a student at the University of California, obtained leave from his classes and was taken on as a paid employee, conducting operator exams for ship billets. Woolverton, as Radio Inspector, signed the tickets for the successful candidates. Ellery received \$80 for that month, his first paid job!

In 1914, Ellery Stone was appointed Assistant Radio Inspector, with a starting salary of \$100 per month. This was raised to \$115 in 1915, and to \$120 in 1916. As assistant radio inspector, he did all the inspection work aboard ships and in shore stations. He boarded every wireless-equipped ship which came into San Francisco harbor, sometimes lugging upwards of 40 pounds of test equipment; wavemeters, antenna meters, decimeters, etc.

On March 16, 1917, when Ellery was only 23, he was commissioned a Lieutenant (jg) in the U. S. Naval Reserve by Captain E. H. Dodd, U. S. N., the Pacific Coast Communication Superintendent (PCCS) at "Goat Hill," and ordered to active duty at NPL, San Diego, on April 6, 1917, which was the day the United States entered World War I. Within two months he was made District Communications Superintendent (DCS) of what is now the 11th Naval District (then the southern half of the old 12th Naval District.), and Officer in Charge, U. S. Naval Radio Stations, San Diego. The transmitter, a 200 kw Federal arc at Chollas Heights, was operated by Gunner H. L. Rodman, under Lt. Stone. The receiving station was at Point Loma where Ellery had an office and later, a house. He served there until 1919.

After his release from active duty in 1919, he became California manager of Kilbourne & Clark of Seattle, who supplied and maintained radio equipment and provided operators for one third of the U.S. Shipping Board ships built during WWI. Then he became General Manager of Moorhead Laboratories and of Lee DeForest Inc., of San Francisco. In 1922 he managed the radio department of the Pacific States Electric Company, a GE subsidiary. In 1924, at the age of 30, Ellery Stone was named President of Federal Telegraph Company and came to International Telephone and Telegraph Corporation when Federal was acquired by ITT in 1931. Subsequently he held various executive positions with ITT. Among them were: Executive Vice President, Mackay Radio and Telegraph Company; President, Postal Telegraph-Cable Company; until its merger with Western Union in 1943; ITT Regional Vice President for the Middle East in Cairo 1947-48; President, Federal Telephone and Radio Corporation 1948-49; President, American Cable and Radio Corporation and its subsidiaries 1950-58; ITT Group Vice President of Defense activities 1959-61; and President, ITT Europe, Inc., at Brussels 1961-65. At the time of his retirement in June 1969 after completing 45 years of service in the ITT system, he was a Vice President of ITT, Chairman of the Board of American Cable and Radio Corporation, Vice Chairman of the Board of ITT Europe and Director of various American and European subsidiaries. He was a Director of ITT from 1948 to 1968.

Admiral Stone's naval career began in 1917, and he advanced through grades in the Naval Reserve to Rear Admiral in 1944. He served during World War II and was decorated with both the Navy and the Army Distinguished Service Medals. He was the only reserve officer in either service in WWII to receive both. He retired from the Navy in 1958, after 41 years of naval service.

Admiral Stone is the author of technical papers in the Proceedings of the I.R.E. and the I.E.E.E., and the U. S. Naval Institute Proceedings, and of a book: "Elements of Radio Communication," which has gone through three editions, the latest, 1926, published by D. Van Nostrand & Company, New York. The first edition of this book grew out of a series of lectures which Admiral Stone (then a lieutenant) gave in 1917 and 1918 to aspiring Navy radiomen at NPL.

* * * * *

September 26, 1959
177 Athena St.,
Encinitas, Calif.

Mr. Jerry Mac Mullen, Director,
Junipero Serra Museum,
San Diego, Calif.,

Dear Mr. Mac Mullen:-

In reply to yours of September 21, I am thankful to you for your kind acknowledgement of receipt of the group of photos and other matter and I shall send quite a collection of other photos which may be of historical interest to you and the public in general- as soon as I may identify and describe the various units. In addition to the destroyer wrecks I am sending some official photos, also some snap shots of some of the old time radio equipments. In addition to these, I am sending one of the rarest of documents of radio interest. This is my personal commercial certificate which allowed me to become officially a recognized commercial wireless operator, long before the present form of certificates were even printed.

As I am an old time San Diego boy, having attended school at Sherman Heights in 1898, I believe that this certificate should be of interest historically. By the way, my certificate was the third issued in San Francisco and was used for about three years in commercial operation.

It is with great pleasure that I dig into my seventy five year old mind to recall and record such information about old and obsolete wireless equipments as I have personally used some some fifty or more years ago.

I started my wireless experiences in 1905 in San Francisco with a rolling pin, wrapped with bell wire as a tuner, using a coherer made by boring a hole in a piece of broomstick and placing iron filings in the hole and then plugging the open ends of the broomstick with plugs of zinc, using the zinc plugs and iron filings for a coherer, using a bell wire for a detector. My antenna was a single bell wire of about 100 feet in length from a warehouse to my room, it was made by means of broken necks of bottles. My receiving condenser was an old telephone condenser of unknown values and a telephone receiver had been discarded by the telephone company after it had been badly damaged in a warehouse fire. My transmitter was a Ford spark coil, using a loading coil made by the old Electro Importing Company. The key was home made.

William Larzalere was the first amateur in San Francisco and I became the second man. With this equipment, I communicated with Electrician Talmadge at Tatoosh Island, Washington on several occasions. Mr. Fred Ward of the Carborundum Company in San Francisco gave me a bucket of carborundum scraps, at my request and I constructed a detector for the use of carborundum, making a phonograph needle, screw driver prongs operated satisfactorily that I took several of these detectors to the navy. I enlisted in the navy two years after. I used carborundum, Mr. George Hanson, radio hobbist and inventor invented the very same thing and it became standard in the navy.

use in the coastal radio stations.

I enlisted aboard the flagship "Chicago" at San Diego on February 23, 1910 and was not attached to the wireless room but I was interested and on April 18, 1909 I was listening and copied the message to our flag ship but did not receive credit for that work because I was not officially attached to that work. I have sent you my copy.

The wireless equipment of the "Chicago" will not be discussed except for the antenna. This antenna ran from foremast to mainmast and was of fully insulated wire with six conductors, all bonded together with loops at intervals, making this a sort of hexagon from mast to mast.

At Point Arguello, where I was assigned in 1909, we had a bare Island modified 1 KW transmitter, consisting of a Robbins-Meyers DC motor, operated from our own dynamo, there being no power from land lines installed; a generator attached to the motor and developing 120V 60 cycle to the primary of an open ended transformer of the same voltage and frequency. The oscillator was of the direct coupling type with the spark gap in the center. The condenser consisted of 24 sheets of 24" X 24" glass plates with 16" X 16" centrally located tin foil with tabs for connections. Condenser and spark gap were connected to the lower end of the oscillator, using about a third of the turns. The secondary circuit (antenna circuit) used almost all of the sixteen turns of the coil, the ground being at the lower end and the antenna passed thru a hot wire ammeter to the antenna. Almost at the feet of the operator was an impedance coil, in the shape of a "U" with windings on both legs of the iron core. The core was securely held by an adjusting screw to keep it from jumping when current was applied. The antenna was suspended from the 170 feet high wooden mast by glazed porcelain insulators and entered the shack thru an air space insulator of the same material.

The receiving set consisted of a tuned tuner. It consisted of a coil of spaced wire which traveled from a full coil of wire, wrapped around a wooden round roller, the free end of the wire passing to an adjacent roller, where it was held taut by a spring as needed for tuning, by means of a contact was made by a wiping brush contact between the rollers, making a rather slow means of tuning, as speed would be made poor contacts.

Band 1,000 phones were used and Edison's carbonized detector was used, except when we tried out silicon, iron pyrites and galena for use, which so often was better than the carbonized detector.

Distance in transmitting was generally less than a thousand miles at night and two hundred miles in the day time. Static was a bad feature at this station.

We had no wave meter and the wave length was not known except when some ship station "guessed" that we were on the air or the wave length.

During the earthquake days, when land lines to San Francisco were down, the Southern Pacific Railroad sent their train orders to Yerba Buena Island, thence to Lonsdale, thence to Arguello and Arguello sent the train orders to the ship. This was the first time in wireless telegraph history that land orders were sent across sea to control trains.

My next duty was aboard the "Arethusa". This steamer, built about 1884 had been a British tramp steamer and during the Spanish-American War, the navy bought this steamer, converted her cargo spaces into tanks and used this ship to carry fresh water to the ships of the fleet. During the cruise of the White Fleet, the Arethusa left the East Coast and went as far as Honolulu. This ship had no evaporators and could not make any fresh water, even for its own use. Another steamer, the "Iris" bought at the same time did have twenty one evaporators and could make water from the sea but she was very slow.

The wireless equipment of the "Arethusa" was transferred to the "Iris" by the writer in 1906 and this equipment will be described here. It was a Slaby Arco (Telefunken) set consisting of a mercury interrupter operating at 80 volts in all, that is, the motor used 80 volts D. C. and this motor pumped mercury in a small tank which held ten pounds of mercury, throwing a stream of mercury from a nozzle to and against a segment attached to the shell of the tank compartment. This segment was divided into sections, in order that the stream of mercury might be broken into as many segment parts as was necessary to provide a pulsating D. C. at 80 volts. This current went through the transmitting key to the 12" spark coil (with vibrator sealed in the closed position) returning to source of supply.

The secondary of the 12" spark coil (transformer) emitted the customary high voltage to the condenser and thru the spark gap and primary of the oscillation transformer and back to source of supply. The oscillation transformer was closely coupled, that is, both circuits were using the same coil of the oscillator and whereas the primary used but four or five turns, the secondary or antenna used almost all of the turns to reach the necessary wave length to the antenna. This was a very poor outfit and only on a few occasions could I manage to get over six hundred miles. We used a Shoemaker receiver, a close coupled affair with a platinum wire and cup of dilute sulphuric acid for a detector. This Wallaston wire of only 1/10,000 inch diameter was silver coated, for handling purposes and in use, it was necessary for the acid to burn the silver off before we could get signals. In operation, the platinum wire (antenna) was barely dipped in the cup of acid. The rolling of the ship would lift the wire from the acid and the breaking of contact would burn the end off the wire and we would have to prepare the end again for service. I learned that a bit of cotton would carry the acid and by draping the end of the wire over the damp cotton I could operate when the ship rolled, even violently.

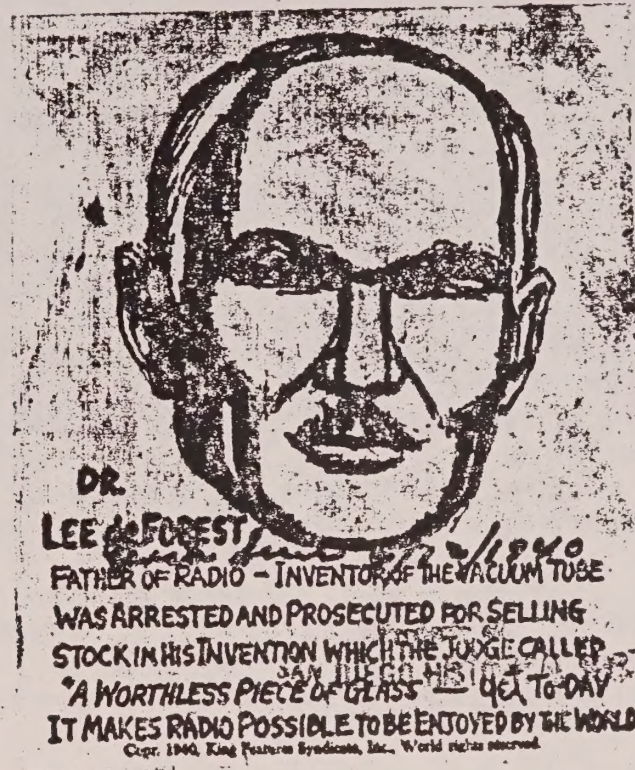
The Iris had been the British stater Dryden, later being the Menemsha, built at Newcastle, England in 1874 and was 104 feet long and had a two cylinder engine for propulsion. She could do ten knots in speed under the best of conditions if every sailor aboard hoping for more speed, pulled on his oar in a hurry.

That is about all of the information which I can remember at this time and I hope that it will be of some help to you.

Edward B. Stevens (7)

Sincerely,

WIRELESS TELEGRAPH
RADIO

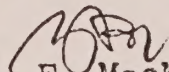


Point Loma Naval Wireless Station was commissioned in 1906. Dr. DeFOREST came here in 1908, in the USS CONNECTICUT, flagship of RADM Robley D. ("Fighting Bob") Evans. DeFOREST was conducting experiments in wireless telephony.

Algie HUDGENS, Union Title Insurance & Trust Co., recalls a DeForest wireless installation (apparently ship-to-shore traffic) in the Granger Block about 1900. City Directories reflect UNITED WIRELESS TELEGRAPH CO. (Branch), A. F. KRENKE, local manager, 501 Granger Block, 1909-10; the company had opened the year before (1908) with W. O. EDWARDS listed as local mgr. Apparently they moved and changed name (or were bought out) in 1911, for that year's directory lists the Federal Telegraph Co., U. S. Grant Hotel, with KRENKE as manager, for several years (up to 1917) from 1911 on. Federal Telegraph moved to the First Ave. side of the Spreckels Theater Bldg. about 1918, and remained there until around 1928, when it became the MACKAY RADIO (a subsidiary of POSTAL TELEGRAPH).

HUDGENS should be contacted for details on first transmitter. The FEDERAL outfit used a Poulsen direct-current arc transmitter, which caused great sorrow to local radio "hams" as its scratching, crackling note could not be tuned out. With an arc, which is relatively slow to start and cut off, the dots and dashes were produced by shifting wave-length. When the key was up, the set was out of tune; when it was depressed, it shorted a few turns of the transmitting helix, and put the set in tune. The same system carried over in transmitters of the Alexanderson Alternator type, and the CW, or vacuum-tube. The call letters of the Federal station were, as I recall, K S S.

Oct. 26, 1956


G. F. MacMULLEN

AMATEUR RADIO

MEMORANDUM TO THE FILES

SUBJ: AMATEUR RADIO

Oct. 26, 1956

1. Amateur radio (wireless) stations were in existence in San Diego as early as 1908; Algie HUDGINS (Un. Title Ins. & Trust Co.) good source on this.

2. First amateur transmitters were battery-operated spark-coils, either designed for wireless use, or coils from automobile ignition; early autos had one spark-coil for each cylinder. The coil, a condenser, spark-gap, key and helix (directly connected to aerial and ground) or an "induction coil" (a primary circuit, connected with coil and spark-gap, and a secondary circuit, connection aerial and ground, which picked up its energy by induction). Later, step-up transformers, using 110 A.C., were used. Also some of the old spark-coils were retained, and were energized by 110 A.C. working through an electrolytic interrupter.

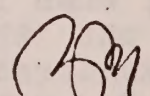
3. Receivers originally were exclusively of the crystal type, using carborundum crystals, silicon crystals, or galena crystals, with a one-slide tuning coil, fixed condenser, and single ear-phone. This progressed to multi-slide tuning coils, "loose-couplers," variable condensers, loading-coils, and double ear-phones.

3. Pioneers in amateur radio were the late Fred WISNER, Walter FORD, Earl IREY, Algie HUDGINS, Harry FLENNER, ---McROBERTS, Leslie WINSHIP, Everett LITCHFIELD, , Edmund BRUNELLE, Orland K. BULLARD, Myron JONES, etc. Long-distance reception was a leading activity, the amateurs vying with one another in getting distant Navy and commercial stations; the goal was to achieve reception of NAA (Arlington, Va.) and NAR (Key West, Fla.)

4. Everett LITCHFIELD was one of the first, if not the very first, to use an "Audion" (vacuum-tube) receiver; other pioneers in this field were Harold BUMBAUGH and Paul GALE, of Lemon Grove.

5. Additional information from early amateurs should be developed as available, especially on call-letters and techniques. In the matter of call letters, the amateur's call was preceded by the number 6 (this being in the Sixth Radio District) and were, whenever possible, the initials of the operator, or letters from his name. (Examples: Fred WISNER, 6FW; Walter FORD, 6WF; Earl IreY, 6IR, etc.)

6. All amateur radio stations were closed down during World War I, and all antennas were taken down -- although some of the amateurs quickly found that a certain amount of traffic could be picked up by using the window-screens, or even bed-springs, as antennas.


G. F. MacMULLEN
(6MV, in 1913, 6AL after WW I)

See also "Amateur Wireless Hangers
War Vessels" - Union 9/2/10